Laptop backup We test four tools that automate the time-consuming task of backing up important data stored on laptops. PAGE 55.

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

April 22, 2002 ■ Volume 19, Number 16

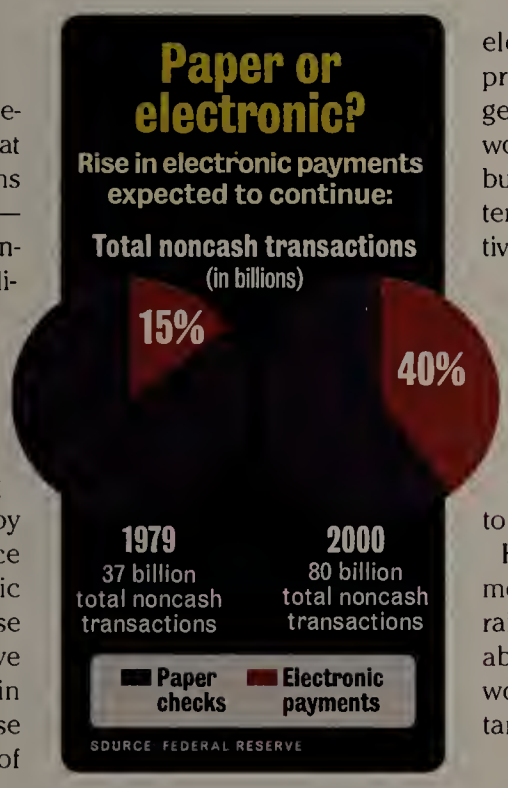
Fed: Old nets out; Web in

Public embrace of electronic payments called motivation.

■ BY ELLEN MESSMER

DALLAS — The Federal Reserve — 12 central banks that handle interbank transactions for 9,600 financial institutions — last week said it intends to eventually ditch its proprietary applications, dial-up and even its SNA network in favor of using the Internet. That transition should be well under way by year-end, officials say.

Among the factors prompting this move is a detailed study by the Fed — the first update since 1979 — that shows electronic payments are soaring while use of paper checks may have topped out. The growth in Automated Clearing House (ACH) payments, the type of electronic payment the Fed processes, will require a new generation of high-speed networks and a better way to share business data through "open systems," according to Fed executives.



The Fed's decision-makers say a new network based on the Internet will offer easier access to banks and their corporate customers for processing payments and obtaining historical data needed to resolve routine conflicts.

However, putting large-scale money-processing on the Web raises serious security concerns about hackers and hybrid-worm threats damaging monetary-transaction flows. Fed offi-

See Federal Reserve, page 72

Cisco eyes bigger role in storage

■ BY DENI CONNOR

Cisco is expected to charge the storage market as soon as next month with the introduction of a storage switch that supports Fibre Channel, SCSI and Gigabit Ethernet.

The switch will have eight Fibre Channel and two Gigabit Ethernet ports, letting it route SCSI data over IP and simplify storage-area network (SAN) configuration by replacing existing Fibre Channel switches. Sources expect the switch to have many of the same management features as Cisco's SN 5420 router.

Opinions differ as to how much of an impact Cisco can make on a storage market in which it has not been much of a factor. But there is no doubt the

See Cisco, page 16

"[Lack of experience] is a criticism we've heard before when we entered two other well-established markets: the SNA market . . . and voice over IP. We've done pretty well in both instances."

Soni Jiandani
Vice president of marketing, Cisco

Congress: Tighten IT security

■ BY CAROLYN DUFFY MARSAN

WASHINGTON, D.C. — Prompted by last year's terrorist attacks, momentum is building on Capitol Hill to expand the role of the National Institute of Standards and Technology in establishing IT security standards and best practices. But the prospect is raising concerns in some circles.

Four bills are pending in the House and Senate that would double or triple the annual funding of NIST's Computer Security Division. One of these bills, the Cybersecurity Research and Development Act, passed the House with overwhelming support.

After Sept. 11, the House Science Committee held hearings on the cyberterrorist threat and the lack of a coordinated U.S. response. The hearings focused on the need for more research and targeted NIST for

See NIST, page 14

XML the glue for unified messaging

■ BY JOHN FONTANA

WebServices EARLY ADOPTERS
Second in a three-part series

All Terri Kouba wants is a little flexibility.

As a systems developer at the University of California, Berkeley, Kouba is spearheading an effort to create a unified communications system. The system will tie e-mail, voice mail and fax to a single in-box and allow access to it from anywhere — be it an e-mail client, a telephone, or a mobile phone or device.

Oh, and Kouba wants it to be open enough so that she can mix and match vendors or add new technologies as they come along.

She thinks she's found the answer in Web services.

The university is in the midst of its three-month Unified Communications Technical Pilot, whic

See Web services, page 14

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NetworkWorld

News

- **8 AirFiber** adds backup to optical gear.
- **8** Start-up **Gemplex** offers VPN options.
- **10 Microsoft users** tired of **patch management** headaches.
- **10 Volera** steps up enterprise CDN offering.
- **18 Sigaba** secures server transactions.
- **18 Smarts** manages app. delivery systems.

Infrastructure

- **21** MasterCard pushing IP-based BankNet as alternative to X.25 abroad.
- **21** Coalsere sets up for storage automation.
- **22 Dave Kearns:** Larry got it right.

Net.Worker

- **25** Adventures in Bluetooth.

Enterprise Applications

- **33** Honeynet Project hopes to sting hackers.
- **33** Enigma software helps U.S. Navy pare down its paper stash.
- **34** Configuresoft boosts administrative controls.
- **34** Marimba strengthens its desktop management suite.
- **36 Scott Bradner:** Instant messaging — problems of success.
- **41 Special Focus:** LDAP: Improving access to directory applications.

Service Providers

- **45** XO launches new Ethernet options.
- **45** Teleglobe unifies its managed data services.
- **46 Johna Till Johnson:** IP VPNs: Different flavors for different tastes.

The Edge

- **47** Avici takes peering, DoS defense to the edge.
- **47** NextHop scales routing software.

Technology Update

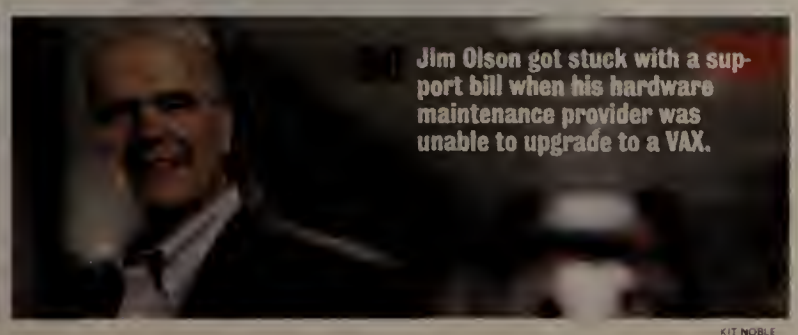
- **49** Traffic shapers ease WAN congestion.
- **49 Steve Blass:** Ask Dr. Internet.
- **50 Mark Gibbs:** Running down the Web services checklist.
- **50 Keith Shaw:** Linux-based PDA is pretty Sharp.

Opinions

- **52 Editorial:** ILabs testing sets stage for N+I 2002.
- **53 Sandra Gittlen:** For storage, continuity is king.
- **53 Daniel Briere and Russ McGuire:** Gig-E, G-PON, Gee-Whiz.
- **74 Backspin:** <My brain hurts./>
- **74 'Net Buzz:** BookCrossing.com: An online haven for book lovers with heart.

Management Strategies

- **60** Negotiating hardware maintenance: Critical needs, available resources and past experience help executives justify service costs.



Jim Olson got stuck with a support bill when his hardware maintenance provider was unable to upgrade to a VAX.

KIT NOBLE

Features

Face-Off
Should vendors be liable for security flaws in their software? **Page 51.**

Review
Laptop backup: We check out four tools that automate the tedious task of backing up valuable data stored on laptop devices. **Page 55.**

51 **Bruce Schneier, left, and Harris Miller debate whether vendors should be accountable for vulnerable products.**

WORLD CLASS Winner

Review
Dantz Development's Retrospect Server Edition 5.6 provides a unique way to back up data on servers and clients. **Page 59.**

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Forums

Chat room blocks?
Shaun D. seeks advice on using Border Manager to block users from chat rooms. Got any?
DocFinder: 9042

And what about Internet services . . .
Meanwhile, Sami is looking for suggestions on how to keep certain users from accessing certain Internet services at specific times. Something to set on his firewall?
DocFinder: 9043

Settings help
Neil needs help on distributing appearance settings to a 300-plus Windows 2000 network. Suggestions?
DocFinder: 9044

Interactive

Products your peers love
Two new recruits have joined the ranks of our reader review program, Test Pilots. This week, Test Pilot Mets Fan gives a 5 out of 5 to Orinoco's PC Gold Card and Wireless Access Point, saying it improved the speed and reliability of his company's wireless net. Test Pilot LanMover reviewed NetGear FS105 Fast Ethernet Switch, rating it a 5.
DocFinder: 9045

Columnists

Compendium
Classic course
Fusion Executive Editor Adam Gaffin looks at one man's effort to set up a library or museum of "classic software products" before they're forgotten.
DocFinder: 9046

Help Desk
Firewall recommendations
Columnist Ron Nutter offers a reader advice on whether one firewall is enough.
DocFinder: 9047

SOHO Tech
Three ways to safer files
New Net.Worker columnist James Gaskin offers methods for keeping files nearby, easy to find and safe.
DocFinder: 9048

Seminars and Events

Wireless ready?
Is your network ready for wireless? Find out with our free Tech Update "Integrating and managing wireless in your network" event. **DocFinder: 8546**

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News Bits

IETF blesses SNMPv3

■ The Internet Engineering Task Force Steering Group recently approved Version 3 of the Simple Network Management Protocol (SNMPv3) as a full standard. The IESG also moved SNMPv3's predecessors, SNMPv1 and SNMPv2, to historical status — meaning there will be no more development on those standards. SNMPv3 contains additional security and authentication features that provide data origin authentication, data integrity checks, timeliness indicators and encryption to protect against threats such as masquerade, modification of information, message stream modification and disclosure. Jeff Case, an original author of SNMP and CTO at SNMP Research, a developer and distributor of management protocols, says the IESG's decisions may hasten adoption of the more secure SNMP. "This eliminates any mixed messages coming from the standards community," Case says.

Diffie to head new Sun security office

■ Sun has formed the new Sun Global Security Program Office intended to raise Sun's profile on computer security matters. Whitfield Diffie, Sun's well-known cryptography expert and an outspoken critic of restrictive encryption policies by governments here and abroad, has been given the title of chief security officer for this new division. Its goals include improving communications between customers and business partners about Sun's security products and expanding Sun's relationships with security organizations.

Hitachi fires back at EMC

■ A week after being accused of infringing six patents that EMC owns, Hitachi has filed its own lawsuit in a U.S. District Court seeking damages against EMC for the infringement of eight patents. The complaint, filed in the Western District of Oklahoma, contends that certain EMC data storage systems, including products in EMC's Symmetrix and Clariion product lines, infringe on patents owned by Hitachi, based in Tokyo, and Hitachi Computer Products America. Representatives from Hitachi and EMC could not immediately be reached for comment. EMC recently filed suit in the U.S. District Court in Worcester, Mass., seeking damages for copyright infringement and requesting in a separate complaint that the International Trade Commission block Hitachi from importing the infringing products into the U.S.

Web services group cites progress

■ AT&T, Proctor & Gamble and Sabre have joined the Web Services Interoperability Organization, the group announced last week during a two-day meeting of member companies in San Francisco. WS-I also set a third-quarter release time for the first set of industry recommendations and example applications for making Web services work smoothly between software from multiple vendors. WS-I is a consortium of technology companies bent on standardizing a method for delivering software and services over the Internet. The group formed in early February in an effort to devise testing tools and standard documentation to let competing vendors ensure that Web services software is compatible. WS-I includes technology heavyweights Microsoft, IBM, Intel, Hewlett-Packard and BEA Systems.

FCC gives flight to satellite services

■ The Federal Communications Commission last week granted seven companies permission to offer services such as broadband Internet over satellites. The companies were given licenses to offer satellite services over shared Ku-band frequencies (10.7 GHz through 14.5 GHz). The FCC granted licenses to Hughes Electronics, Boeing, Teledesic, Virtual Geosatellite, Denali Telecom, SkyBridge and Loral Space & Communications. The FCC also approved a sharing method for orbiting satellites that would address the problem of interference between the satellites.

Federal lab buys Linux-based supercomputer

■ The U.S. Department of Energy's Pacific Northwest National Laboratory has ordered a $24.5 million Hewlett-Packard supercomputer that runs Linux for its facility in Richland, Wash. Scientists will use the computer to study chemical problems in life sciences, material design, atmospheric chemistry and combustion. The computer consists of 1,400 of Intel's next-generation Itanium processors, code-named McKinley and Madison. The computer will have 1.8 terabytes of memory and 170 terabytes of disk space. The computer should reach processing speeds of 8.3 teraflops (8.3 trillion floating point operations per second) at peak performance, making it the most powerful Linux computer in the world, HP says.

IBM won't charge for e-business XML

■ IBM last week said it will not charge royalties on its patented technology within the e-business XML or ebXML standard. In March, IBM contacted the Organization for the Advancement of Structured Information Standards, in Billerica, Mass., to say it has one patent and a patent pending on technology it had developed for the standard, says Carol Geyer, director of communication for OASIS. IBM says it will let that technology be used for free. "This is very good news," Geyer says. IBM could have chosen to charge a "reasonable or nondiscriminatory" royalty on its patents, which cover some of the fundamental parts of the ebXML standard.

■ TheGoodTheBadTheUgly

DARREN GYGI

Net for victims. Crime victims can now be kept up to date on their cases through a new database system the Justice Department has established. The Victim Notification System notifies victims and their families of each step in a case — from arrest through imprisonment —through letter, e-mail, fax or pager.

Forgot to study. That's the best that can be said for Jerry Sanders, CEO of chipmaker Advanced Micro Devices, who as a witness for Microsoft last week admitted he had not read the antitrust sanctions that the software giant is appealing. Sanders' reason for being on the stand was to call those sanctions bad for the industry. ➤

Pickle for Google. German railway operator Deutsche Bahn is threatening to sue Google because the company's search engine provides links to a Web site that offers instructions on how to sabotage railway systems. Deutsche Bahn recently sent letters to search engine operators asking them to remove links to two stories from the German-language publication *Radikal*, which has been outlawed in Germany. Google had no public comment.

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AirFiber adds backup to optical gear

Redundant devices can reduce lost links.

■ BY TIM GREENE

SAN DIEGO — AirFiber says it has overcome a major obstacle to free-space optics, or the sending of data across open space using lasers: What happens if the beam is blocked or the equipment fails?

The company this week is introducing a transmitter/receiver called AirFiber 5800 that can be configured so if a flock of birds or heavy rain disrupts the beam, and hence traffic, between two devices, another pair takes over without losing or delaying data transmission.

Free-space optics (FSO) is optical technology that does not require optical fiber and provides high-speed connections between sites that have no physical optical fiber links or between sites where it would be difficult and expensive to install them.

FSO devices are mounted on buildings or inside windows and pointed at each other to establish connections. Competing vendors include Aoptix, fSona, LightPointe, Optical Access, quantumBeam and TeraBeam. These others do not support the type of backup AirFiber is introducing, according to Lindsay Schroth, an analyst with The Yankee Group.

Makers of such equipment say the lasers that carry network traffic from point to point can beam data at speeds ranging up to 2.5G bit/sec and over distances up to about three miles, although speed and reliability drop with distance.

The beams are also affected by fog, rain and snow, which can disperse the signals, and flights of birds that can momentarily block the beams.

In the past, such disruptions resulted in gaps of service that were tolerated or, in the case of some vendors, backed up by slower radio-frequency connections. But redundancy is pricey because users have to buy twice the amount of gear, Schroth says.

AirFiber says the 5800 also includes features to increase performance and reliability to the point that, unlike today, providers could offer service-level agreements on services that the gear supports.

These include having the laser inside the casing of the device and shooting the beam at a receiver by bouncing it off an internal mirror, protecting the laser's lenses from water droplets that could disperse signals.

The 5800 also includes a feature known as active tracking that guards against the beams' drifting off target. The feature periodically adjusts the aim of the lasers to ensure that the center of the beam hits the center of the receiver.

To reduce the support gear the devices require, they support a management channel on the optical path itself, eliminating need for a separate management network.

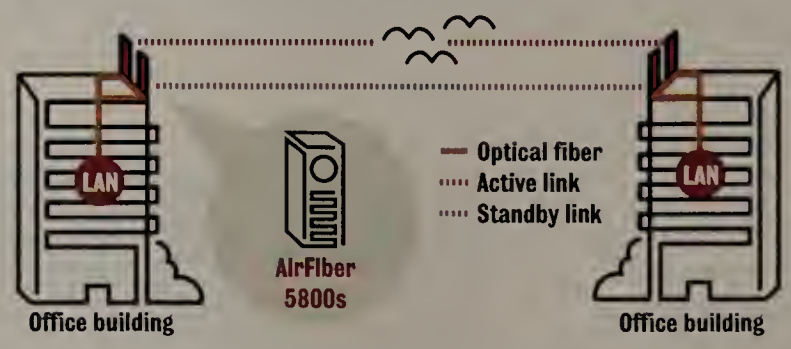
FSO gear can prove reliable without these features, says Thomas Gifford, owner of Xfactor Multimedia in Seattle, which uses a fiberless optical service from TeraBeam. The link hasn't failed in two years, he says.

Vendors also can boost reliability by engineering links that are short enough so the lasers can power through potentially disruptive weather and widening the focus of the beam to avoid drift problems, explains Dave Dunphy, an analyst with Current Analysis.

AirFiber 5800 is available now for $25,000 per pair that supports a 155M bit/sec link. ■

Bird-proof beaming

AirFiber's redundant 5800 free-space lasers constantly monitor the status of the active link and fail over to the backup if a unit fails or birds disrupt the signal.



Start-up Gemplex kicks off IP VPN offerings

■ BY DENISE PAPPALARDO

VIENNA, VA. — Gemplex is set to launch IP VPN services this week that will let users set up secure IP networks in 37 countries.

The start-up service provider is targeting small and midsize businesses that it says are underserved by the large multinational service providers such as Equant, Infonet and WorldCom.

"We're talking about businesses that bring in $200 million and $500 million in annual revenue and have five to 50 dedicated sites," says Hemant Kanakia, Gemplex founder and CEO.

Although Gemplex has only been around 18 months, the company is launching its initial IP VPN services in 530 cities. The suite of services includes Private IP VPN, Flexible IP VPN and Mobile IP VPN offerings. The company can offer these services in so many cities because it is not deploying its own fiber or building its own physical points of presence.

Instead, Gemplex is leasing network capacity from international service providers such as Global Crossing to connect its network operating center in Virginia with its leased POPs around the globe. Gemplex also is collocating its switching gear and teaming with local carriers around the world to establish POPs.

"This is a tough market for service providers these days," says Jeff Phillips, director of consulting at TeleChoice. Gemplex's business model may prove successful if it can get enough customers on its network and manage its partners, he says.

But teaming up with other service providers is risky. The majority of Gemplex's international fiber is leased from Global Crossing, which filed for bankruptcy protection in January and has been under Securities and Exchange Commission scrutiny.

"Within the next 30 days we will have migrated the majority of our traffic to another provider's network," Kanakia says. While Gemplex says service quality has not suffered, it is making the switch to ensure service continuity.

Phillips says that while Global Crossing and other large fiber-rich carriers are having financial trouble, there are typically no problems with their networks.

Gemplex has deployed Juniper M20-series switches that support Multi-protocol Label Switching (MPLS) within local switching facilities of carriers around the globe. Gemplex connects its switches via its global leased network, which is managed and monitored from the company's network operating center.

The company says it avoids teaming with incumbent local carriers and instead teams with competitive local service providers and ISPs that also sell Gemplex's IP VPN services locally.

The company's Private IP VPN service is a fully managed dedicated, network-based offer. Customers connect to Gemplex's network via dedicated T-1, E-1 or T-3 lines. Customers are not required to use a specific vendor's router at their customer premises to connect to the service because all the smarts and traffic prioritization are supported within the network, Kanakia says.

Gemplex says its service is an alternative to frame relay for small and midsize businesses that may find frame too expensive. "Our service, supporting a 30-site VPN, is about 50% cheaper than a fully meshed frame relay network," Kanakia says.

Private IP VPN service comes with a standard service-level agreement (SLA) that guarantees round-trip latency will not exceed 60 msec in the U.S., 25 msec in Europe, 120 msec in Asia and 70 msec for trans-Atlantic traffic. Gemplex also guarantees 99.99% network availability and minimum packet loss that varies depending on country. Customers in the U.S. are guaranteed packet loss will not exceed 1%, while customers in India are guaranteed packet loss will not exceed 3%.

Gemplex's Flexible IP VPN is a CPE-based service that lets customers use the Internet to connect to Gemplex's network. This service uses IP Security (IPSec) tunneling between the user's router and Gemplex's Juniper box for secure connectivity over the Internet. Flexible IP VPN service also has a standard SLA that guarantees round-trip latency will not exceed 85 msec in the U.S., 50 msec in Europe, 145 msec in Asia and 95 msec for trans-Atlantic traffic. The same minimum packet loss guarantee applies, but the network availability guarantee does not because users will connect to Gemplex's network via a third-party ISP.

Mobile IP VPN lets remote users connect to Gemplex's network using a Cisco software client deployed on individual PCs. This client establishes an IPSec tunnel between the user and Gemplex's network. This service does not come with a standard SLA. ■

PROFILE: GEMPLEX

START-UP COMPANY

Location: Vienna, Va.

Founded: 2000

Business: IP VPN services in 37 countries, 500 cities.

Management: Hemant Kanakia, CEO and chairman; Gian Dilawari, COO.

Financing: $28 million from Canaan Partners, Invesco.

Competitors: Equant, Teleglobe, Infonet, AT&T, WorldCom.

Target Customers: Small and midsize business users.

Microsoft users tired of patch mgmt. headaches

■ BY JOHN FONTANA

IT executives are fed up with Microsoft's kludge of tools to manage and install the numerous patches and hotfixes it issues and say the company must deliver one management tool that works reliably and consistently, or companies will never have secure systems.

Frustrations are running high after two incidents showed Microsoft's patch-management tools sometimes offer conflicting data that could leave systems vulnerable to security breeches. That riles IT executives who often hear from Microsoft that certain security breeches can be avoided if systems are properly patched.

"Someone needs to get serious about patch management over at Microsoft, because IT administrators have become the losers," says Russ Cooper, editor of the NT BugTraq Web site and the surgeon general for TruSecure.

Microsoft has issued 20 security and hotfix patches this year.

Cooper says Microsoft needs to provide an accurate and reliable way to patch systems instead of the current mishmash of services, tools and download sites. Short of that, experts say, Microsoft's recent Trustworthy Computing initiative to develop secure code will be useless to IT.

Cooper says the answer doesn't lie with Windows Update Corporate Edition, scheduled to ship this spring, because it has the same accuracy problems as the Microsoft service called Windows Update — it can't guarantee successful patch installation.

Windows Update is one of two tools at the heart of the patch-management mess. The other tool is HFNetCheck, which scans systems for security patches. HFNetCheck is integrated with Microsoft's Baseline Security Analyzer.

The most recent issue occurred this month with patch MS02-018, which was for Internet Information Server. The patch contained a file with the same version number — but a different date — as a file from a previous patch, MS02-012 (which addressed SMTP issues).

Windows Update didn't overwrite the MS02-012 file, but reported the patch was successfully installed. A subsequent scan using HFNetCheck reported a problem with the patch installation. Also, if the MS02-018 patch was installed from a link provided in a security bulletin instead of through Windows Update, the MS02-012 file was overwritten. Users had no idea which version of the file was correct.

In a February incident, the tools offered conflicting data when patches were partially changed, but the version numbers were not altered when using the Windows Update service. In that case, HFNetCheck reported that the patches were not the most current version, but they were.

"I can't necessarily trust what HFNetCheck or Windows Update tell me I need," says Paul Calvi, director of IT for Annual Reviews. "Ideally, Microsoft would produce a single patch-management tool for all its software products that would manage, deploy and report on all patches."

But Calvi says he needs such a tool "yesterday" and he wants it from Microsoft. Currently he uses software from St. Bernard Software. Other patch-management vendors include Shavlik Technologies, which sells a professional version of HFNetCheck; Configuresoft; Ecora and PatchLink.

Whatever Microsoft does, experts say, it has to resolve three problems: too many patch-management tools that aren't in sync; too many vehicles for delivering patches; and inconsistent patch-installation technologies.

Microsoft says it is working on consistency and automation.

"We are looking at how do we get HFNetCheck to accurately reflect what Windows Update is doing," says Steve Lipner, director of security assurance at Microsoft. "What will take longer is getting to an overall integrated or common patch technology."

Some users say there should be a suite of tools that get data from a single Microsoft source. Steve Sheldon, a Microsoft certified systems engineer for a large securities vendor he asked not be named, says the tools need to be integrated with Active Directory so when a machine is added into the directory it is scanned and the necessary are patches applied. "The key is ease of use and automation. The more [manual] work you have to do, the more likely something will be missed." ■

Patch tools

Microsoft offers a number of tools for patch management, but users say the mishmash causes as many problems as it solves. Here's a sampling:

Windows Update:	A service from Microsoft that checks for installed software and missing updates and patches. Patches are automatically installed.
Windows Update, Corporate Edition:	A version of Windows Update that runs within a corporate network. IT executives can apply their own set of policies for controlling the rollout of patches.
HFNetCheck:	A command-line tool that scans systems to ensure that recommended security hotfixes and patches are up to date based on a list available from Microsoft.
Baseline Security Analyzer:	Scans one or more Windows-based computers for common security misconfigurations. Checks that recommended security hotfixes and patches are up to date.

Volera steps up enterprise CDN offering

■ BY JENNIFER MEARS

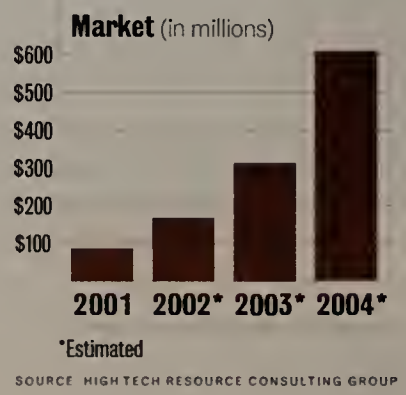
SAN JOSE — Volera this week is announcing upgrades to its Velocity content delivery network package aimed at making it easier for businesses to manage, secure and deploy Web-based applications.

The market for enterprise-focused content delivery products is growing as businesses look to improve network performance and cut costs. Businesses consider building and managing their own CDNs or enterprise CDNs should think about security, management and ease of deployment, analysts say.

Volera, a wholly owned subsidiary of Novell, introduced its Velocity CDN package last year to help businesses deploy and manage CDNs. Velocity CDN consists of Volera's Excelerator caching software, its System Controller and Content Controller management software, and Content Accountant software, which lets businesses track CDN usage for billing and content delivery. The software can run on any Intel-based hardware platform.

Hot CDN products

Businesses are deploying more CDN hardware and software to improve network performance.



SOURCE HIGH TECH RESOURCE CONSULTING GROUP

"The trend is that a lot of [the Web acceleration companies], Volera included, are trying to integrate or at least come up with an offering that integrates several different features and that also allows for ease of use, ease of deployment and management," says Maximilian Flisi, an analyst at IDC. Volera competes with Inktomi, InfoLibria, CacheFlow, Cisco and Network Appliance in the CDN market

The upgrades to Velocity CDN, include the latest releases of Volera's software-based caching package, Excelerator 2.2 and Media Excelerator 1.2, and its management products, System Controller 1.2, Content Controller 1.2 and Content Accountant 1.2.

Specific features within the upgraded Velocity CDN include:

- Centralized management of security policies so that users can set security rules such as authentication and access control within Velocity CDN and have them enforced at each Excelerator. The upgrade also includes improved URL and content-filtering features.
- Virtual private CDNs, which let customers configure a CDN and then authorize departments to publish and manage their own content.
- Improved streaming media management and delivery, supporting IP multicasts and more efficent use of bandwidth to deliver rich media applications.

W. L. Gore & Associates of Newark, Del., best known for its Gore-Tex fabric, has beta-tested Velocity CDN. Richard Sun, network systems engineer at the company, says he's interested in the authentication and access control that can be integrated into the Novell Directory Services his network uses.

"We also like the fact that we can integrate filtering into this product so we can block questionable sites," he says.

The upgrades to Velocity CDN are scheduled to ship April 30. Pricing has not yet been finalized. ■

Regional Floral Network, January 14

Regional Floral Network, February 14

Online Gift Retailer, October 24

Online Gift Retailer, December 24

Internet Tax Prep Service, September 14

Internet Tax Prep Service, April 14

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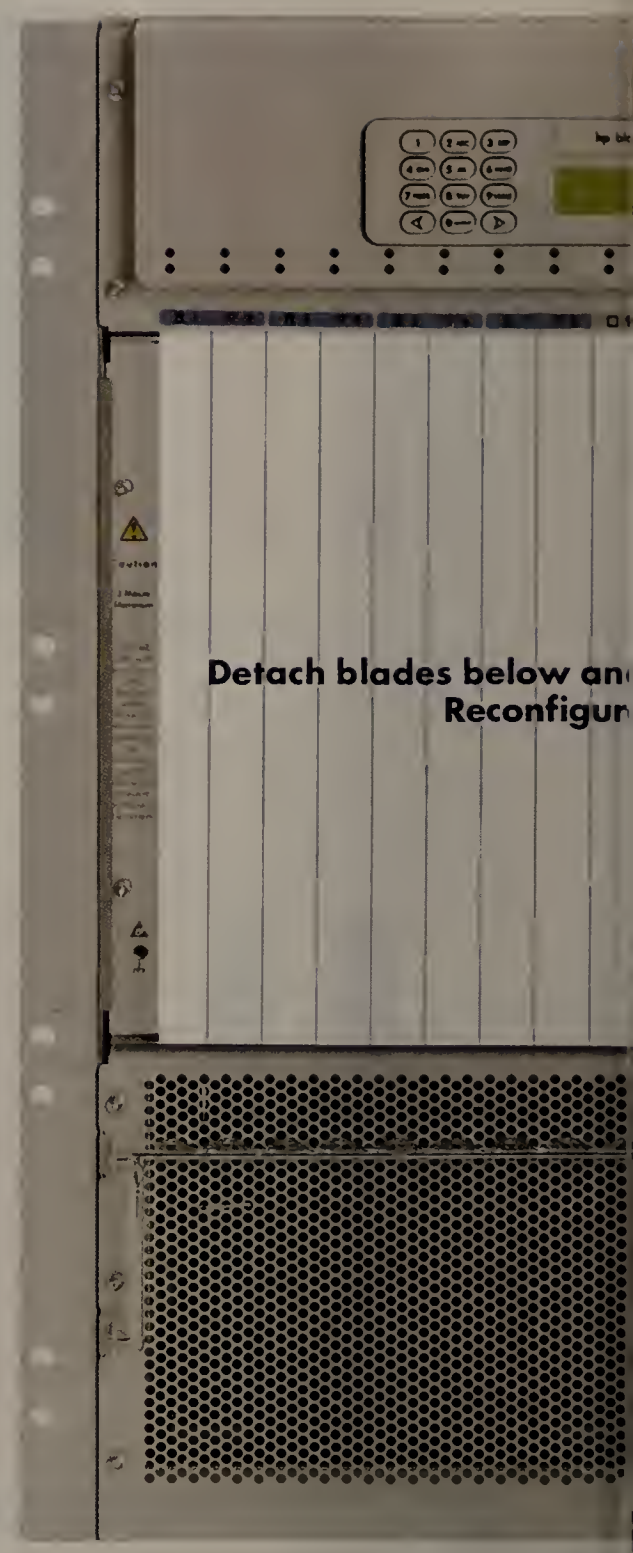
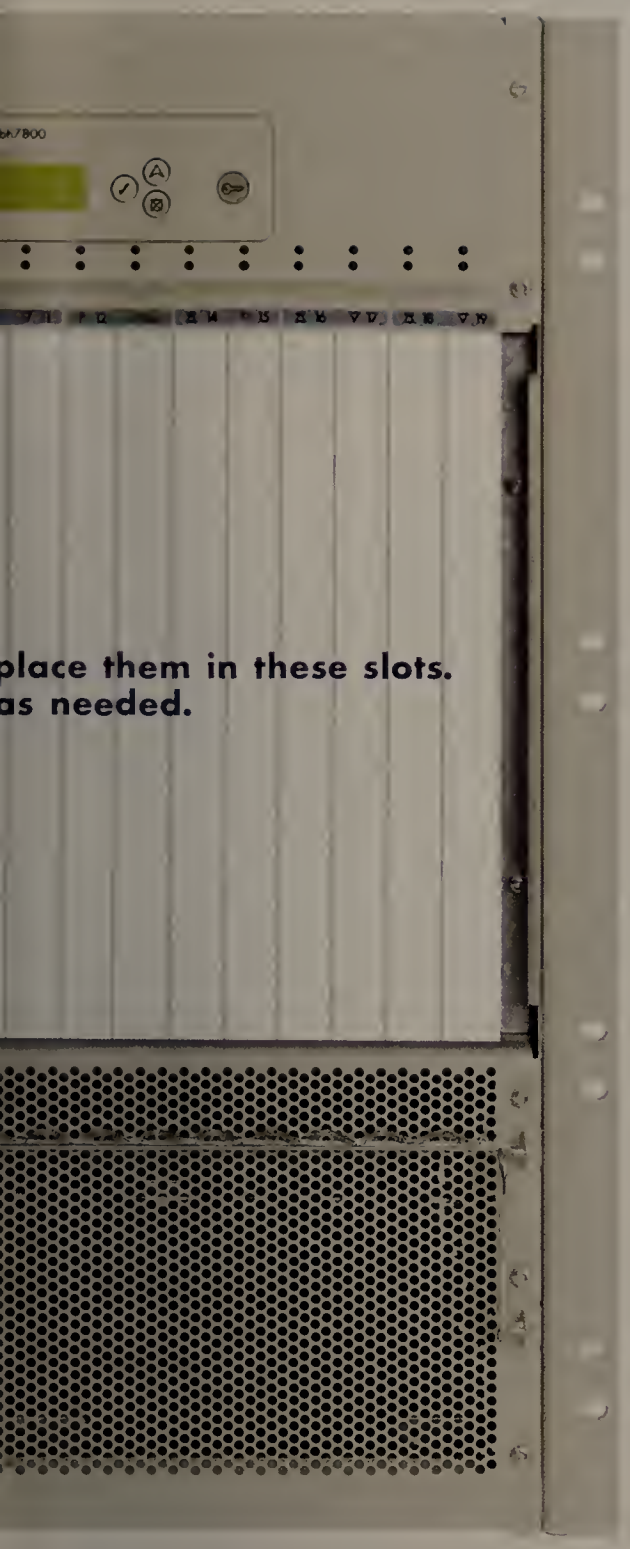
More efficient and reliable.

Since all blades in the chassis share the same power and cooling source, they're also more energy and space efficient. In fact, you'll find HP Blade servers



server blades

storage blades



reduce the typical number of fans and power supplies required by as much as 60%.

The reliability advantages of moving to blades are profound. To give you some perspective, imagine building a server cluster solution that is comparable to a fully loaded HP Blade server cabinet. The projected annual failure rate of the HP Blade server solution is about 41% lower than that of the comparable server cluster.

In the unlikely event that a blade should fail, the problem is isolated in the same way that multiple systems connected by I/O are isolated from each other.

Is your server as sharp as a blade?

Servicing a blade is as easy as deploying one. Each blade is freely accessible from both the front and rear of the cabinet and can thus be replaced at a moment's notice. Each slot can be powered on or off separately. Hot-swap and hot-plug technology is implemented throughout, allowing for the seamless addition or replacement of blades while the rest of your infrastructure continues to hum.

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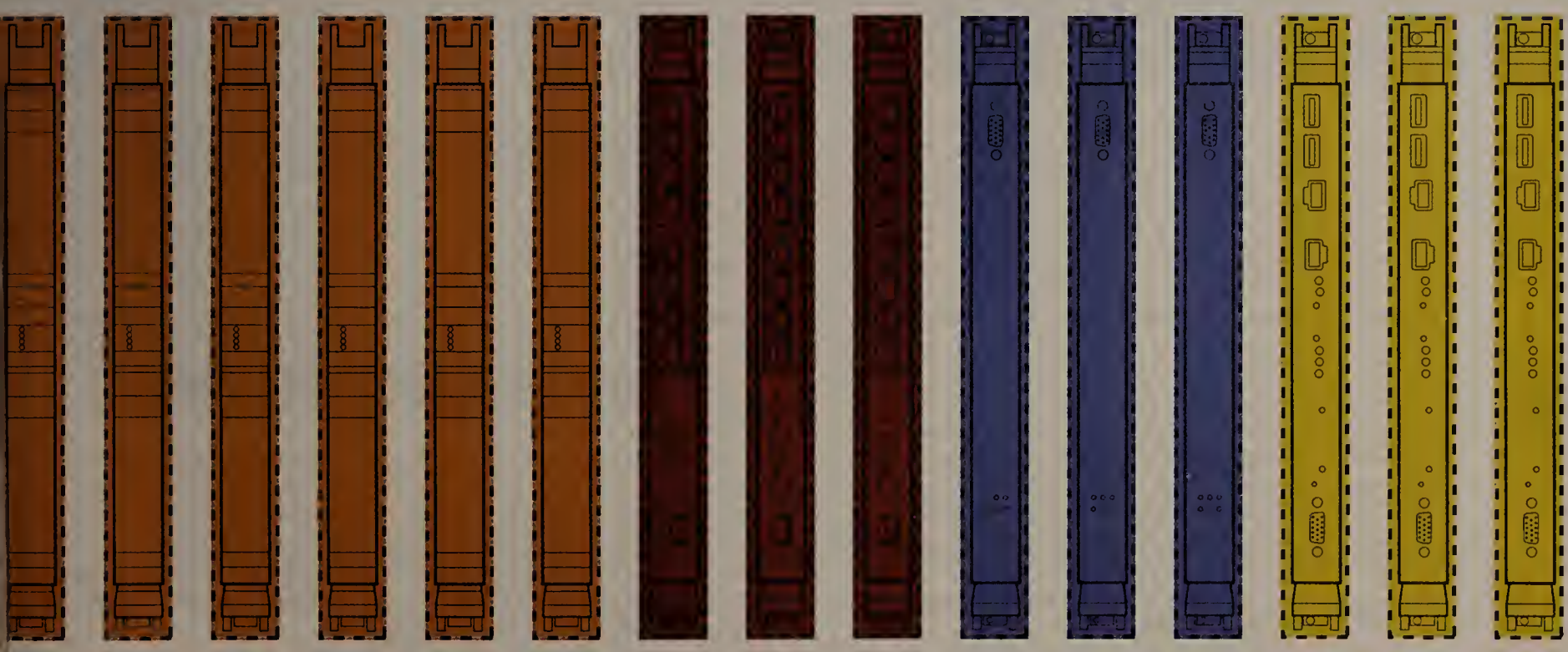

NIST

continued from page 1

much of the money. Other committees have focused on tightening the security of federal IT systems, which NIST oversees for all but national security systems. Lawmakers believe NIST needs "teeth" to be able to put more pressure on federal agencies.

While applauding the Hill's new focus on cybersecurity, industry trade groups and network security vendors worry that NIST could get too involved in determining the features of network security products. Any new certification processes from NIST could slow the delivery of new products and make them more expensive for corporate buyers, industry observers say.

"While we strongly support the intent of these bills that call on NIST to develop security standards, we're concerned that this could migrate into the government determining product standards," says Mario Correa, director of Internet and Network Security Policy at the Business Software Alliance (BSA). BSA is a lobbying group that includes IBM, Network Associates and Novell.

"We want to make sure that NIST creates a floor [for network security products], not a ceiling," Correa says.

NIST, an arm of the U.S. Commerce Department, already exerts major influence by selecting cryptography standards and reviewing the security of IT products and systems that the federal government buys. Many network vendors — including Check Point Software, Cisco, CyberGuard, Entrust, Network Associates, Lucent and Oracle — have had their products certified that they meet NIST requirements.

Vendors say any new security requirements they must meet for the federal market will likely have a ripple effect on commercial offerings, even though NIST's guidelines are voluntary for corporate IT buyers.

"If NIST is going to get more involved in security standards, it will help vendors to be NIST-certified in commercial accounts," says Tom McDonough, CEO of CyberWolf Technologies, which sells enterprise security management software.

Located in Gaithersburg, Md., NIST's Computer Security Division consists of 45 technologists and has an annual budget of $10 million.

The division selects cryptographic standards and runs a testing program to ensure IT products apply these standards correctly. The division conducts research in IT security and offers advice to federal IT buyers about evaluating system security.

The division accredits private laboratories to test the security of IT products such as firewalls, intrusion-detection systems and database software under a program called Common Criteria. Common Criteria evaluations will be mandatory for U.S. national security systems purchased after July 1.

"We get this question a lot about how our role is changing post-Sept. 11," says Edward Roback, NIST computer security division chief. "What we like to say is that we're turning up the intensity."

One of NIST's ongoing efforts is updating existing guidelines for how federal IT managers should assess the security of a major IT system. NIST also is establishing an accreditation program for private-sector organizations that conduct IT security reviews.

NIST works with the U.S. National Security Agency (NSA) to create recommended security targets for various classes of IT products. Since Sept. 11, NIST and NSA have stepped up their efforts to create security targets for 10 key technology areas, including operating systems, VPNs and smart cards. Private laboratories validate whether specific products meet these targets.

Some network security vendors embrace the idea of NIST creating security targets for additional classes of IT products.

"I'd like to see NIST getting more money to develop security targets for other products, including security management platforms like CyberWolf's," says Juanita Koilpillai, chairman of CyberWolf. Users of CyberWolf's software, which coordinates information from intrusion-detection, firewall and network management systems, include the Department of Defense and the Federal Emergency Management Agency.

"One of the things our government customers look for is who has tested the software and how it's been evaluated," Koilpillai says. "If NIST has more funding, it will make it easier for the vendors to get certified."

Steve Bellovin, a computer security expert with AT&T Labs and one of the directors of the Internet Engineering Task Force's Security Area, says NIST does a good job of developing cryptographic standards and could use extra resources to speed its work and keep its processes open.

"I don't think anybody else is quite in the position to do some of these things," Bellovin says. "There's a limited amount of expertise in the world to design cryptographic algorithms."

However, Bellovin says NIST doesn't have a good track record in establishing broader IT security standards. As evidence, he points to the lack of industry support for NIST's Common Criteria program and its predecessor, the Orange Book.

"The problem that's inherent to this class of standard is that the evaluation process is time-consuming and expensive," Bellovin says. "Orange Book-evaluated systems were a lot more expensive and one or two years late. . . . Common Criteria is doing better because there are more testing labs, but it's still a lengthy evaluation process."

Bellovin says to improve cybersecurity, vendors need to take an architectural approach to designing security into their products — something that NIST can't test.

"The two biggest issues in security are buggy code and total system architecture," Bellovin says. "If Common Criteria requires more discipline in development and results in less buggy code, that's great. But it's not going to solve the architectural failures. We just don't know how to do that yet." ■

"[NIST's evaluation process] is time-consuming and expensive. . . . Orange Book-evaluated systems were a lot more expensive and one or two years late."

Steve Bellovin
Director of Security Area, IETF

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Web services

continued from page 1

will put standard interfaces on existing e-mail, voice mail and fax systems using Simple Object Access Protocol (SOAP) and XML. The latter is used to convert one system's output into XML documents, which are sent via a SOAP message to another system. The receiving system's Web services interface converts the sender's XML documents into an input it understands, letting the two communicate.

If the university's pilot works as planned, the effort will go live early next year for 50,000 users.

"Web services are like Lego blocks," Kouba says. "They will enable us to move into the future without replacing an entire architecture." The university will use its existing e-mail servers as part of the new system.

Web services provide a flexibility that the university has never had because it always has been locked into one technology for voice mail, one for e-mail and one for fax. Now the school can tie it all together without being required to change or replace anything as would be required in a typical monolithic unified communications system, which Kouba say is another lock-in she doesn't want.

"Web services will allow users to get any message from anyplace at any time through any device," Kouba says. "It will also allow us to have a single number, so you can reach me at one number for my phone, cell phone, fax and pager."

She says a Web portal will let users set rules for routing their calls. "So we not only have the single-number reach but it also gives us a call-routing feature we don't have today."

Kouba knows the desired results will cost money, although she won't know the exact amount until the pilot is complete. "We don't know if we'll need one or 15 boxes," she says. "We want redundancy so we will double all the hardware we buy. It could be some pretty serious money, but it is for a customer base of 50,000."

She also says her network architecture will see little change, because all the servers will be deployed in one data center, but that there will be administrative costs to ensure up-time.

The university is executing the pilot with the help of MagnetPoint, a Web services company that specializes in creating Web services interfaces for communication systems.

Web services technology, a collection of standard protocols based on XML, is typically touted as integration technology for e-commerce systems. Kouba says MagnetPoint caught her eye in applying Web services to unify her communication systems.

What she likes about MagnetPoint's Web services is that they turn a message into a neutral object that is transmitted from the sender to the receiver. The objects are passed using SOAP messages that contain XML documents.

"It is kind of like UPS. UPS doesn't care what is in the box, they just say they are going to come pick up a box and take it from the sender to the receiver. That's what Web services is going to do for us," Kouba says.

The pilot system connects three servers, all of which run on Sun hardware and the Solaris operating system:

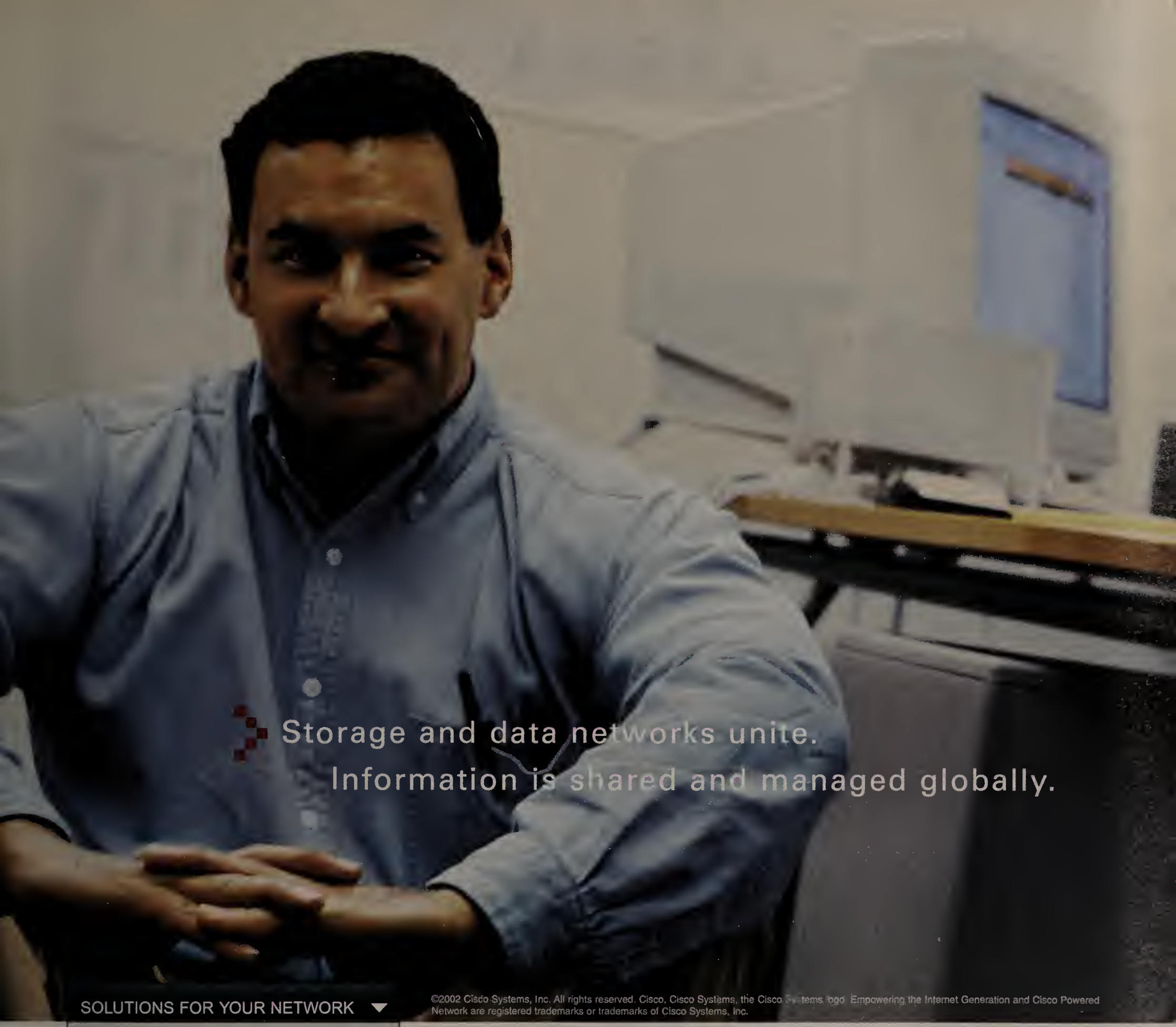
A message server that runs Sendmail, which was developed at UC-Berkeley in 1981, holds e-mail and voice mail, which is stored as a .wav file.

A telephony server acts as a gatekeeper between the phone system, the messaging server and the third leg of the stool, MagnetPoint's Presence and Availability Server (PAS). PAS is a collection of more than 100 Web services modules that are prebuilt interfaces to various systems, including e-mail, telephony, directory, and calendaring and scheduling.

PAS also is the rules and routing engine, dictating where a message is delivered and to what device. Communication between the PAS and other communication servers is handled by Web services interfaces using SOAP and XML.

When a call comes in to the university's PBX, which is leased and

See Web services, page 16



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Cisco

continued from page 1

network giant has muscled into the storage world over the past year with a number of significant initiatives including:

- Investments in storage startups such as Andiamo Networks, which is making a multiprotocol storage switch, and StoreAge Networking Technologies, a storage-virtualization vendor.
- Formation of an internal Storage Technology Group that is on equal footing with Cisco's 12 other divisions.
- Introduction of the SN 5420 storage router, which is meant to transport data over IP using the iSCSI protocol.
- Release of the ONS 15540 dense wave division multiplexing (DWDM) optical switch, which is used to bridge geographically separated Fibre Channel SANs.
- A series of agreements with storage vendors such as QLogic and EMC to deliver storage over IP and Fibre Channel over IP (FCIP), which is used to bridge SAN islands.

There also has been rampant speculation within the industry that Cisco intends to acquire a Fibre Channel vendor to gain expertise in the technology and collect market share.

Analysts say that while Cisco could be perceived as a threat to other storage vendors, the company still has a lot to learn about how storage works.

"To date the company is still trying to learn to speak the storage lingo and learn what is important to customers and what isn't," says Steve Duplessie, an analyst with Enterprise Storage Group. "But, in spite of that, Cisco is clearly not someone you can take lightly."

Cisco officials insist they are up to the task.

"[Cisco's lack of storage experience] is a criticism we've heard before when we entered two other well-established markets: the SNA market ... and the voice market through voice-over-IP technologies," says Soni Jiandani, a Cisco vice president of marketing. "I'd say we've done pretty well in both instances."

One Cisco user says the company will do well selling storage to its installed base.

"The [FCIP] box may come in handy for disaster-recovery scenarios," says Scott Vieth, systems administrator for the Medical College of Wisconsin in Madison. "Since we're a Cisco shop, we'd be inclined to look at that device over similar devices from other vendors."

Others are a bit more cautious about Cisco's foray.

"Even though we'd lean to other providers for storage, it is an interesting offering in a space that is new to Cisco," says Chip DiComo, manager of global information systems for Hellman Worldwide Logistics, a transportation company in Miami.

DiComo has Cisco routers but says his router specialists don't manage storage, therefore they don't need storage devices that are managed in the same fashion and have the same features as their storage routers. Recently, Cisco added features such as the Cisco Discovery Protocol (CDP), CiscoWorks and Simple Network Management Protocol to its SN 5420 Storage Router.

Cisco is interested in IP and Fibre Channel SANs because of the vast market opportunities they present. Fibre Channel SANs — sales of which IDC analysts say will grow to more than $4.2 billion by next year from $423 million in 2000 — have been the traditional way of transporting storage data. They also are expensive, require skilled workers to implement and lack interoperability.

IP storage (iSCSI) has been proposed as a familiar and inexpensive way to transport data over the IP network. FCIP, a draft specification within the Internet Engineering Task Force, will be used to bridge isolated Fibre Channel SANs for replication and business continuity purposes.

Cisco plans to introduce more products that use iSCSI and FCIP. Cisco recently ditched a long-standing deal with Brocade, the largest storage switch maker, to make FCIP gear of its own.

Cisco and Brocade allied in April 2001 to make an FCIP blade for Cisco's Catalyst 6500 and 7600 series switches that would connect any storage vendor's switch and bridge SANs across IP. The deal, which was expected to produce a product by year-end 2001, soured when Brocade delivered a design that connected only the company's SilkWorm Fibre Channel switches to the Catalyst, sources say.

While both companies declined to discuss the reasons for the alliance's failure, they indicated that they will develop their own FCIP blades.

Last week Cisco also announced that it has joined with QLogic to share technology. Sources close to the companies say that the SN 5428 switch will contain QLogic Fibre Channel chips.

The company also will introduce an FCIP module that will join SAN islands as soon as this summer. This module will operate at as much as 350M bit/sec

See Cisco, page 72

Cisco's storage portfolio

The network infrastructure giant is shoving its way into storage with an array of products.

	Protocols used	Intended use	Expected ship date
SN 5420 storage router	iSCSI	Transports iSCSI data over IP	Shipping
Fibre Channel switch	Fibre Channel, FCIP	Links Fibre Channel arrays to hosts, bridges IP SANs	May 2002
ONS 15540 DWDM switch	IP	Bridges SANs over IP	Shipping
FCIP PAM for Catalyst 6500	FCIP	Bridges SANs over IP	May 2002

Web services

continued from page 14

runs off-site at Pacific Bell, it is routed to the telephony server, which sends a SOAP message that checks the call-routing rules on the PAS. If the rules call for the message to be delivered to the phone, it is routed to the receiver's phone. If the call is not answered, it is rolled over to the telephony server, which again uses a SOAP message to check the rules for what to do. If the call is to be routed to voice mail, the telephony server records the message as a .wav file and routes it to the message server again using an XML document carried by a SOAP message. The XML document is converted at the messaging server using its Web services interface to a format it understands.

When a user checks e-mail, he can play the .wav file and even forward it to another user. If the user checks for messages via the phone, a VoiceXML interface announces new messages and provides options that can be selected from the keypad. The .wav file is then converted to analog on the telephony server and played over the phone. If the user wants to check e-mail, a text-to-speech system will be integrated into the PAS with a Web services interface. The university has not yet chosen a product to perform that function.

Similarly, if the user accesses the network with a cell phone or a device with a wireless connection, the PAS recognizes the device and sends the requested messages out through an appropriate module built for the user's device.

Users also have the option of installing a small desktop instant-messaging client that the PAS can use to send notifications of new messages and to see if other users are online and to send them messages.

"The biggest benefit is that we are not locked into any device, any type of message," Kouba says. "Tomorrow if we have holograms it just becomes another type of message — another neutral object created using SOAP and Web services."

Another thing Kouba likes is that she is not writing any Web services herself.

"We don't want to become Web services experts. We are a university — our mission is to provide education and research," she says.

The system has a Web portal interface so students, faculty and staff can set up their accounts manually. The system provides them with a phone number, an e-mail account and the ability to set their personal routing rules.

Students pay for the voice-access features, but the in-box is free.

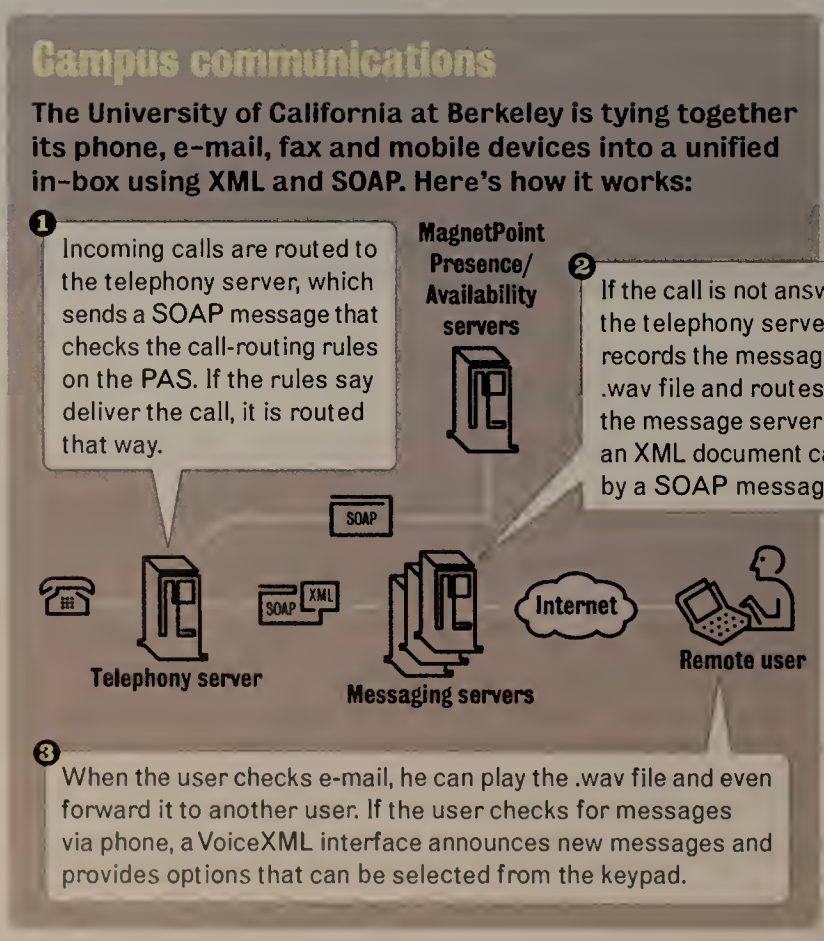
Kouba says she hopes the pilot is successful, but she keeps a critical eye on Web services.

"The scariest part is that Web services is in its infancy; it could crash like X.500 or anything else. If that is the case, hopefully we will find that out in the pilot," she says.

"But we want it to work, we want to make this work," because she says it is the closest thing to IT nirvana she has ever seen. ■

Campus communications

The University of California at Berkeley is tying together its phone, e-mail, fax and mobile devices into a unified in-box using XML and SOAP. Here's how it works:



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Sigaba secures transactions

■ BY JOHN FONTANA

Sigaba Software next week will introduce the next version of its secure software for electronic document delivery with an eye on helping IT executives comply with government regulations for secure communications, especially in the financial services and healthcare arena.

The company is releasing Secure Statements 3.0, server software that encrypts and securely sends electronic documents, bills and invoices via e-mail. The software is used primarily for secure electronic document delivery and for electronic bill presentment.

Secure Statements 3.0, previously called Sigaba Courier, features intelligent decryption, expanded document support, and auditing and reporting tools.

IT executives say the software and its 128-bit encryption has the potential to help them comply with regulations such as the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the Gramm-Leach-Bliley act, both of which have provisions that require secure communication.

Noncompliance of the regulations can result in big fines, but the technology to comply traditionally has been difficult to set up and maintain.

"HIPAA compliance and ease of use, those are the big keys for Sigaba," says John Willars, IT director and HIPAA security officer for Mission Hospital in Mission, Texas. Willars runs Sigaba's Secure Email product for internal communications and is looking into Secure Statements for use with the hospital's third-party providers such as Medicaid and Medicare.

"We looked into a public-key infrastructure [PKI], but the overhead cost is out of our reach," Willars says. "We obviously need to modernize our communications system, but our expertise is in healthcare, not technology, so we need something easy." Willars says the ease of use comes from knowing that customers and partners only need a Web browser and an e-mail client to receive secure documents.

Analysts say the ease of use of secure messaging products, such as those from Sigaba, Tumbleweed, PrivateExpress and CertifiedMail, is a critical factor when IT departments consider how they will comply with government regulations.

"These systems get you around having to deploy PKI. They can protect your data, and they are easy to set up and are easy for end users. That meets all the requirements," says Joyce Graff, an analyst with Gartner.

The Secure Statements server acts as a gateway and message transfer agent by taking the output from applications that generate bills or documents, stuffing them into an encrypted e-mail message and sending them to the intended recipient.

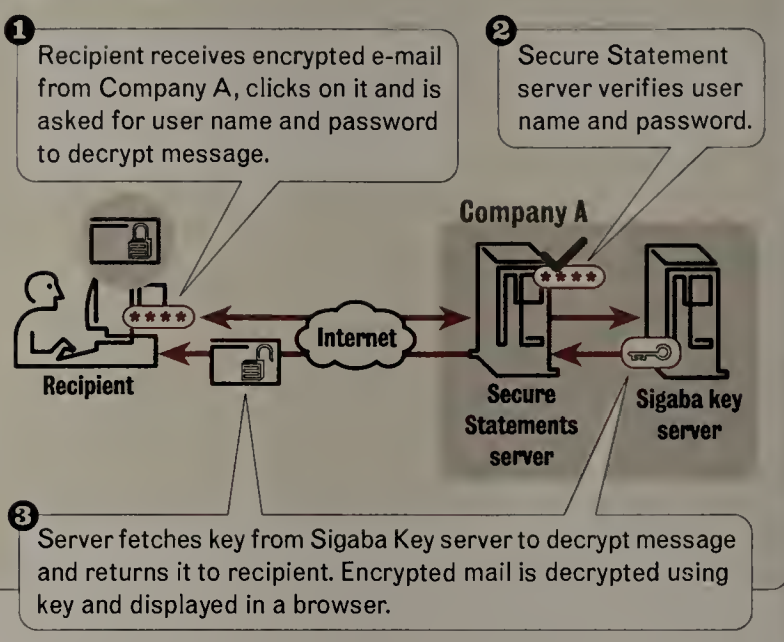
The new features include intelligent decryption, which automatically discovers the best software on the host machine for decrypting a message.

Secure Statements is scheduled to be available April 30. The base price is $50,000 for up to 10,000 messages per month.

Sigaba: www.sigaba.com

Secure transmission

Sigaba next week will ship Secure Statements 3.0, which lets companies send encrypted documents within an e-mail message that the recipient can read using only a Web browser.



Smarts manages across domains

■ BY DENISE DUBIE

WHITE PLAINS, N.Y. — Smarts will boost its management software to help users more quickly pinpoint problems in systems that deliver business applications.

Next month at NetWorld+Interop in Las Vegas, Smarts will unveil its InCharge Application Services Manager (ASM) module, part of the company's InCharge line of network performance and availability software.

ASM plugs in to Smarts' Service Assurance Manager (SAM) to aggregate data from third-party collection agents and other Smarts adapters that plug SAM in to third-party network equipment and management software. The module features a correlation engine that searches the agent information comparing it against a predefined library of potential performance errors to pinpoint application performance problems.

Once loaded onto a server, the InCharge SAM software begins an autodiscovery process on the network seeking out alarms, Management Information Base variables, SNMP event data, system log data or data from other network management software, such as Hewlett-Packard's OpenView or IBM Tivoli's NetView. The software is written to include information about each managed element and the problems that can occur.

A business application, such as online shopping, depends on a Web server, an application server, a database, a router or switch, and operating system software all working in concert to deliver the service to an end user. Many companies, such as Smarts competitors Computer Associates, IBM Tivoli Systems, HP and BMC Software, can monitor and report on the performance of one or each of those elements separately, but Smarts says that with ASM it now can monitor across those domains and manage the total application service delivery cycle.

Until now, InCharge worked to find the cause of problems with network hardware, such as switches, routers and servers.

Glenn O'Donnell, a program director with Meta Group, says the ASM software can help automate some parts of service-level management, which attempts to understand and then manage the relationships between network, systems and software applications within one infrastructure. And although Smarts has yet to reach the goal of fully automating the process, O'Donnell says the statistical analysis that Smarts provides in its software eases and quickens problem identification and resolution for IT managers.

"[Smarts] is helping users map applications to the individual components that make them up, which is primarily a manual process, and no one has figured out how to completely automate it yet," he says.

Pricing for the ASM module begins at around $60,000, depending on network configuration. Smarts InCharge SAM software, which costs $60,000, is required to run the ASM module.

Smarts will announce the beta availability of its ASM module at N+I. The company says the module will be available in July.

Smarts: www.smarts.com

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Short Takes

■ **Dell** will launch an enterprise rack server based on dual Intel Xeon processors in early June. **The PowerEdge 2650** is a 2U-sized (3.5-inch) machine supporting dual data rate dynamic RAM and includes a chipset from Serverworks. It will run Windows 2000 or RedHat Linux 7.2. The box will sit in the middle of Dell's rack server range, replacing the 2550 model that was launched in April last year. Below it will be the company's 1U 1650 dual Pentium III processor machine and above it the 4U 6450 quad Xeon processor box, making it the smallest Xeon-based rack server in Dell's line. The company wouldn't release more details about the machine, although a Dell representative says it will be broadly similar in performance to the PowerEdge 4600 dual Xeon processor tower computer, which was launched in February. He also hinted the price would be similar. The PowerEdge 4600 supports 1.8- and 2.2-GHz Xeon processors and between 512M bytes and 12G bytes of memory, has a 400 MHz system bus and 64-bit PCI-X bus. It costs from $3,900, says Hirokazu Seto, a marketing manager at Dell. **www.dell.com**

■ **Compaq** last week brought out two new storage systems designed to enhance the lower end of its line of network-attached storage products. The **StorageWorks NAS B3000** and the **StorageWorks NAS S1000** are available immediately. The B3000 connects via Fibre Channel to an existing storage-area network, giving users access to both block SAN and file NAS level data in one pool of storage systems. On the lower end, the S1000 is a NAS appliance targeted at smaller customers or branch offices. The B3000 was designed to connect with Compaq's MSA 1000 SAN system via Fibre Channel and add file-level data access to a SAN. The product starts at $43,000 with 288G bytes of storage capacity and a Fibre Channel switch. The S1000 starts at $3,500 for 320G bytes of storage or $5,500 for 640G bytes of storage capacity
www.compaq.com

MasterCard boosts global IP net

■ BY ELLEN MESSMER

ST. LOUIS — With transaction volumes at a record high, MasterCard International is expanding its network reach by opening its first regional data centers in Europe, Latin America and the Far East.

In so doing, MasterCard will take the gospel of TCP/IP abroad: The company overhauled its decades-old packet-switching network to IP-based frame relay three years ago.

Outside North America, banks and their card-processing service providers still tend to rely on slow-speed X.25 packet switching for card processing. While there are still a few X.25 hold-outs among the banks on this side of the ocean, MasterCard IT executives say the majority have embraced IP. Opening local data centers in other countries gives MasterCard the chance to provide specialized payment services, such as wireless card processing. But there also will be a challenge in convincing financial institutions abroad that IP is the way to go in handling financial authorization and settlements.

"Europe has typically been an X.25 environment," says MasterCard's Artie Ahrens, who is working with fellow senior vice president Rob Reeg to architect how the new data centers will link into MasterCard's largely IP-based network called BankNet.


Artie Ahrens says existing X.25 is woefully obsolete.

While X.25 has been a reliable workhorse for decades, it is woefully obsolete, supporting only 19.2K to 64K bit/sec throughput and requiring complex round-robin switching techniques to prevent bottlenecks, Ahrens says. X.25 doesn't support modern Web-based applications that are increasingly important in banking and e-commerce applications.

Most of MasterCard's North American banking clientele, which purchase card services through membership fees, support IP connections to their mainframes and servers. MasterCard installs what it calls the MasterCard Interface Processor in each bank's data center to link bank credit and debit authorization systems into BankNet for real-time processing. A transaction — MasterCard conducted 11.6 billion last year, up 18% from 2000 — occurs in as little as 150 msec between the merchant point-of-sale and the two banks involved. Overall, MasterCard processed close to $1 trillion worth of transactions last year.

A few holdouts in the banking industry still insist on bisynchronous or SNA-type connections, so MasterCard for the forseeable future will have to maintain a multiprotocol network, Ahrens says.

See MasterCard, page 22

Start-up sets storage mgmt. rules

■ BY DENI CONNOR

LAGUNA HILLS, CALIF. — Start-up Coalsere will soon offer software that saves IT administrators time managing storage and increases the efficiency of their IP and Fibre Channel storage networks.

The software, code-named Policy-Driven Storage Management (PDSM), supplies, distributes, installs and reconfigures applications to run on storage networks.

Coalsere is creating software that also can tune networks so they perform well with applications. Using Coalsere's software, rules would be created that could adjust the performance and configuration of a network on the fly to changing conditions. For example, PDSM would synchronize the actions of servers and arrays so the size of an array would not be shrunk just as it was starting to read lots of streaming data.

"We enable dynamic provisioning," says Scott Ruple, president of Coalsere. "Wherever you load our software, whether it's a server, client or switch, you identify the resource available. Our software dynamically provisions those resources on the network" to run applications in an effective manner.

PROFILE: COALSERE

Location: Laguna Hills, Calif.

Founded: July 2001

Product: NAS Accelerator

Product type: Policy-driven storage management

Founders: Scott Ruple, president; Roland Thibodeau, vice president of worldwide sales; Terry Flanagan, chairman.

Founders' backgrounds: JNI, Motorola

Financing: An undisclosed amount from Bootstrapped.

Fun fact: Company name derived from the Latin coalescere — to grow together. Spelling came about by lopping letters off until they got something that looked good.

While Coalsere does not have any users of its software, analysts say they are excited about its prospects.

"There's no question that this type of software is necessary," says Tony Prigmore, an analyst with the Enterprise Storage Group. "It's enormously important because it can easily provide a change management function and because storage is very complex and energy-intensive. We change our configurations frequently. Things don't stay in place very long without requiring some change."

Coalsere's software runs on any Intel-based server or appliance. The company places an agent on each storage device and server that is involved in any storage application process, which lets the software monitor storage operations and tune them to the application or service running on it. Customers can monitor and manage the software from any Web-based console.

PDSM differs from products such as TurboLinux's PowerCockpit in that the policies it invokes are made across the storage network, not only for a particular device such as a server.

Coalsere expects to announce the product in July.

Coalsere: www.coalsere.com

WIRED WINDOWS

Dave Kearns

Larry got it right

"You can only understand Web services if you've been in the fashion industry. Web services are fashionable, just as pink might be this year's fashionable color."

— Larry Ellison

If there were a competition for the most often maligned software executive, Bill Gates would only beat out Larry Ellison for the title because not enough people know who Ellison is (and doesn't that just rub Ellison the wrong way!). The Oracle CEO often has been cited as having the biggest ego in California (a title worth bragging about), and is frequently lampooned when his predictions and pronouncements go, as the Brits say, "pear shaped." Think about "Network Computers," for example.

Even when Larry is right (such as his National Identity Card idea), the way he presents it is sure to antagonize not only those opposed to his idea but many of those still sitting on the fence trying to decide which way to jump. A good example is the above quote from Ellison's keynote address at the recent Oracle Apps World conference. "Web services" really is little more than a buzz phrase right now, appropriated by just about every software vendor who wants to sell you something. But as Ellison went on to say, "...the idea that Oracle is going to put a Web services interface on its applications, and [that] Siebel is going to do that, and that that's going to make it easier for you to connect Oracle to SAP, or Siebel to SAP, that's just the most ridiculous thing I've heard in my entire life." Hyperbole is usually not too far from Larry's rhetoric.

But eliminate the bombastic style, concentrate on the ideas and Ellison has made two very good points.

First, today's "Web services" are simply a recycling of yesterday's "peer-to-peer" services, which themselves were almost indistinguishable from "client-server" services. Most software vendors want to be identified with the flavor of the month, so they'll use the buzz phrases to identify their products — even though the products don't change!

Secondly, there's no such thing as a "Web services interface," and even if there were, vendors would need to do a whole lot more in terms of cooperative computing if they really wanted these services to interact. XML and its brethren will be very useful in this regard, as will the SOAP protocol. But SOAP and XML by themselves don't define "Web services." Ellison got it right this time.

Kearns, a former network administrator, is a freelance writer and consultant in Silicon Valley. He can be reached at wired@vquill.com.

Tip of the Week

The Distributed Management Task Force (www.dmtf.org) has chosen the Open Group (www.opengroup.org) to develop a certification program for the **Common Information Model.** Follow developments at the Open Group — this one could be a feather in your cap!

U.S. Robotics doubles speed of wireless gear

Products compatible with existing 802.11b systems.

■ BY PETER SAYER

U.S. Robotics has boosted the speed of its latest range of wireless LAN products to 22M bit/sec, while retaining compatibility with existing 2.4-GHz systems built to the IEEE 802.11b standard.

Although a faster alternative, the 54M bit/sec IEEE 802.11a, on the market for more than a month, systems based on that standard are not backward-compatible because they operate in a different frequency band — 5GHz, says Juan Lopez, USR's network product line manager.

A full family of products

But USR's 22M bit/sec products — a wireless access point or base station, a PC Card and a PCI adapter — are fully backward-compatible with existing 802.11b wireless LAN systems, Lopez says.

That means the new products can communicate with one another at 22M bit/sec and slow down to 11M bit/sec to communicate with older products.

This backward compatibility with other 2.4-GHz equipment is important because many of the service providers offering wireless LAN coverage in public spaces such as airports and hotels already use 802.11b systems.

Older gear still can benefit from some of the other performance improvements that the new range offers. Because of a more powerful radio, the new products offer 30% greater linear range, or around 70% better area coverage, than existing systems, Lopez says.

Although no finished standard exists for the 22M bit/sec wireless LANs, Lopez is confident that USR's systems will interoperate with those of its competitors when they arrive on the market.

USR's 22M bit/sec products will be available in June, the company says.

The 22M bit/sec Wireless Access Point will have a suggested retail price of $200; the 22M bit/sec Wireless Access PC Card, $100; and the 22M bit/sec Wireless Access PCI Adapter Card, $120.

Sayer is a correspondent with IDG News Service's Paris bureau.

MasterCard

continued from page 21

MasterCard's network already processes card transactions internationally, but this is often through third-party processors. MasterCard is set to merge with one of these partners, EuroPay, this spring, which will lead to a complete redesign of EuroPay's Brussels, Belgium data center.

"Europe has unique processing requirements but also local business opportunities in local domestic processing," Reeg says. He expects the Brussels center will be outfitted along the lines of MasterCard's spanking new 550,000 square-foot. center for 2,000 employees in St. Louis: Gigabit Ethernet to the desktop, Sun Solaris and IBM NetFinity servers, Hewlett-Packard OpenView management and applications written largely in-house. And MasterCard will install IP-based equipment in lieu of X.25.

MasterCard can't force the European banks to move from X.25 to IP for card processing, but "we can give them incentives to do so, by charging higher prices to use X.25 than IP," Ahrens says, because it costs MasterCard considerably more to support X.25 than IP.

Only a few months back, MasterCard opened its first non-U.S. card-processing center in Sydney, Australia, to test the waters on how to provide specialized card-processing services, in this case with taxi cabs processing MasterCard wirelessly.

MasterCard also has plans to open regional data centers in Latin America and the Far East. Reeg and Ahrens say they expect to encounter resistance to giving up X.25. As in Europe, MasterCard perceives there's the potential to deliver specialized payment services locally, or aggregate the MasterCard Interface Processors inside any new data center instead of collocating them at the bank site. In Latin America and the Far East, MasterCard expects to have to spread the work about IP for payments processing.

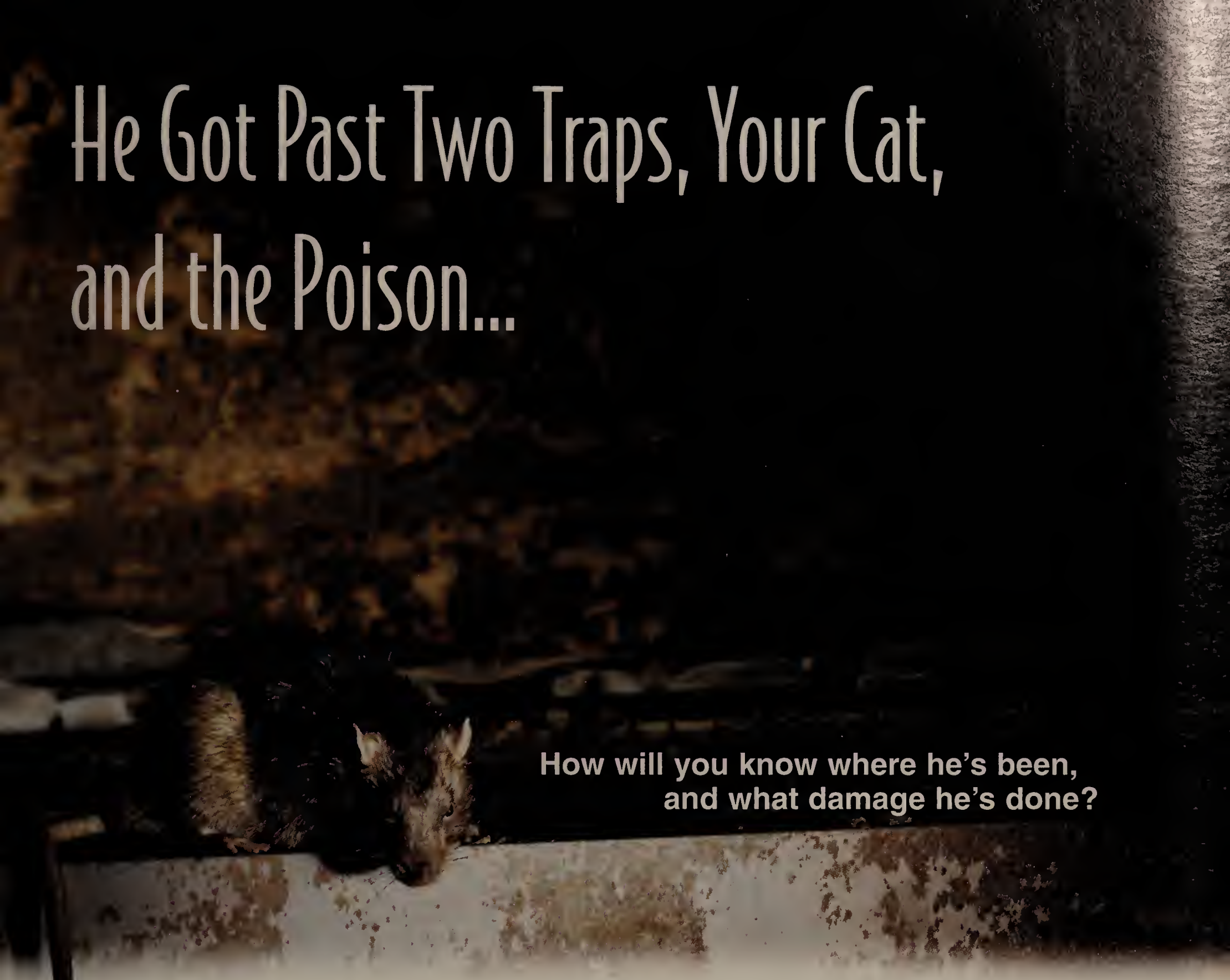
"Europe has unique processing requirements but also local business opportunities in local domestic processing."

Rob Reeg
Senior vice president, MasterCard

The expansion of BankNet also will entail an even closer relationship with AT&T, the carrier MasterCard chose not only for its frame relay service, but also to manage the 984 Cisco routers that make up BankNet.

AT&T worked closely with British Telecom in Europe in a joint operation known as Concert until the two telecom carriers had a falling out and dissolved the partnership last year. "We were happy with AT&T and Concert until they got a divorce," Ahrens says. He says MasterCard likely will turn even more to AT&T for help in managing the expanding BankNet in Europe.

As far as security for its IP network goes, MasterCard would only say it provides firewalls, encryption and proper authorization for BankNet transactions. In fact, just like any bank, MasterCard is subject to the strict security audits that federal regulators, including the Federal Financial Institutions Examination Council, undertake at least once a year on companies in the banking industry. ■



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B402

1. What is the principal business activity at your location?
(check ONE only)

01. ☐ Manufacturing (Non-Computer/ Communications OEM)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/ Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities/Process Industries (Mining/Construction/ Petroleum Refining,/ Agriculture/Forestry)
10. ☐ Government/Military
11. ☐ Consulting (Independent) *
12. ☐ Education
13. ☐ Carriers/Voice/Data/ISP
14. ☐ Web Hosting/HSP
15. ☐ ASP/SSP/MSP
16. ☐ Manufacturing (Computer/ Communications/OEM)
17. ☐ Resellers/VARs/VADs/ Integrators/Distributors* (Computers/Communications)
18. ☐ Other (please specify)

_____

*Attn Consultants, Integrators, Distributors, Resellers: Please complete form based on ALL clients and your own business needs

2. P: What is your primary job function? (check ONE only) S: What additional job functions are you involved in? (check ALL that apply)

P	S		P	S		P	S	
☐	☐	1. Network Management	☐	☐	4. Datacom/Telecom Management	☐	☐	7. Corporate Management (CEO, COO, CFO, Pres., VP, Dir., Mgr.)
☐	☐	2. CIO/CTO/IS/IT/MIS/ Systems Management	☐	☐	5. Internet/Intranet/Web/ E-Commerce Management	☐	☐	8. Consultant (Independent)
☐	☐	3. LAN Management	☐	☐	6. Engineering Management	☐	☐	9. Other (please specify)

_____

3. What is the estimated value of network equipment and services that you specify, recommend, or approve the purchase of?
(Please print the appropriate number code on the line next to each product category. Please complete ALL categories A–O.)

1. $100 Million or more
2. $50 Million to $99.9 Million
3. $25 Million to $49.9 Million
4. $10 Million to $24.9 Million
5. $1 Million to $9.9 Million
6. $100,000 to $999,999
7. $50,000 to $99,999
8. Under $50,000
9. None of the above

A ____ Large Systems *(Mainframes/Minis)*
B ____ Desktops *(Micros/Laptops/ Workstations)*
C ____ Mobile *(including PDAs, Wireless)*
D ____ Servers
E ____ LANs
F ____ WAN Equipment
G ____ Carrier Services
H ____ Internet/Web/E-commerce
I ____ Intranet/Extranet
J ____ Internetworking *(including Routers, Switches)*
K ____ Storage
L ____ Remote Access
M ____ Peripherals
N ____ Software
O ____ Service/Support Services

4. What is the total number of sites for which you have purchase influence?
(check ONE only)

1. ☐ 100+ 2. ☐ 50 to 99 3. ☐ 20 to 49 4. ☐ 10 to 19 5. ☐ 2 to 9 6. ☐ 1 7. ☐ None

8. Please indicate the Web/Security/LAN/Internetworking/Wireless/Mobile/WAN Equipment/ Carrier Services that you are currently involved in purchasing or plan to purchase:
(check ALL that apply) A. Currently involved in purchasing B. Plan to purchase

WEB

A	B		A	B		A	B	
☐	☐	01. Web Servers/Software	☐	☐	04. Web Development Tools	☐	☐	07. Web Acceleration/Caching/ Load Balancing
☐	☐	02. Web Traffic Management	☐	☐	05. Web Content Management	☐	☐	08. Web Hosting Services
☐	☐	03. Electronic Commerce Tools	☐	☐	06. Web Collaboration/ Groupware	☐	☐	09. Other

SECURITY

A	B		A	B		A	B	
☐	☐	10. Firewalls	☐	☐	13. DES Encryption Tools	☐	☐	16. Certificate Authorities
☐	☐	11. Anti-Virus Software	☐	☐	14. Authentication Tools	☐	☐	17. Biometrics
☐	☐	12. Private Key Encryption Tools	☐	☐	15. Intrusion Detection	☐	☐	18. Other

LANs/INTERNETWORKING

A	B		A	B		A	B	
☐	☐	19. Fast Ethernet	☐	☐	26. Storage Backup (Optical, Disk, Tape, RAID)	☐	☐	30. Hubs/Intelligent Hubs/ Stackable Hubs
☐	☐	20. Gigabit Ethernet	☐	☐	27. Network Test/Diagnostic Tools	☐	☐	31. Cables,Connectors, Baluns
☐	☐	21. Layer 3-7 Switches	☐	☐	28. Uninterruptable Power Supplies (UPS)	☐	☐	32. Wiring/Fiber Systems
☐	☐	22. ATM Switches	☐	☐	29. Network Interface Cards (NICs, PCMCIA)	☐	☐	33. Net Management Systems
☐	☐	23. Routers				☐	☐	34. Voice Over IP (VoIP) Tools
☐	☐	24. Network Attached Storage (NAS)				☐	☐	35. Network Analyzers
☐	☐	25. Storage Area Networks (SANs)				☐	☐	36. Other Local-Area Network/ Internetworking

WIRELESS/MOBILE

A	B		A	B		A	B	
☐	☐	37. Wireless LANS	☐	☐	39. Wireless LAN Extension Tools	☐	☐	41. PDAs
☐	☐	38. Wireless/Cell Phones	☐	☐	40. Mobile Data Equipment/Services	☐	☐	42. Other Remote/Wireless

WAN EQUIPMENT

A	B		A	B		A	B	
☐	☐	43. Frame Relay Equipment	☐	☐	48. Voice/Video over IP Gateways	☐	☐	53. DSUs/CSUs
☐	☐	44. Bandwidth Managers	☐	☐	49. Modems	☐	☐	54. PBXs
☐	☐	45. Bandwidth Shaping/QOS Tools	☐	☐	50. Cable Modems	☐	☐	55. Call Center Tools
☐	☐	46. VPN Equipment	☐	☐	51. xDSL Products	☐	☐	56. Videoconferencing Gear
☐	☐	47. ATM Switches	☐	☐	52. Diagnostic/Test Equipment	☐	☐	57. ISDN Equipment/Services
						☐	☐	58. Other WAN Equipment/Services

CARRIER SERVICES

A	B		A	B		A	B	
☐	☐	59. Internet Access	☐	☐	64. ATM Services	☐	☐	69. Wavelength Services
☐	☐	60. Private Lines	☐	☐	65. Managed Services	☐	☐	70. Dark Fiber
☐	☐	61. Frame Relay Services	☐	☐	66. VPN Services	☐	☐	71. Other Carrier Services
☐	☐	62. ADSL/DSL	☐	☐	67. LAN-Extension Services			A B
☐	☐	63. T-1/T-3 Services	☐	☐	68. OC-3/OC-12	None of the above (1 – 71)		☐ ☐ 72.

9. Please indicate the Systems/Peripherals/Software/Applications/Business Services that you are currently involved in purchasing or plan to purchase: (check ALL that apply)
A. Currently involved in purchasing B. Plan to purchase

SYSTEMS/PERIPHERALS

A	B		A	B		A	B	
☐	☐	01. Laptops/Notebooks	☐	☐	06. Fax Servers	☐	☐	10. Mainframes
☐	☐	02. Desktops	☐	☐	07. Remote Access Servers	☐	☐	11. Printers
☐	☐	03. Intel-Based Servers	☐	☐	08. Video Servers	☐	☐	12. Enclosures/Racks/Furniture
☐	☐	04. Risc-Based Servers	☐	☐	09. Mid-Range Systems (including workstations)	☐	☐	13. Other Computers/ Peripherals
☐	☐	05. Print Servers						

SOFTWARE/APPLICATIONS

A	B		A	B		A	B	
☐	☐	14. Desktop/Server Operating Systems	☐	☐	20. Database Management Systems	☐	☐	25. Middleware
☐	☐	15. Network Management	☐	☐	21. Customer Resource Management (CRM)	☐	☐	26. Document Management Tools
☐	☐	16. Systems Management	☐	☐	22. Enterprise Resource Planning (ERP)	☐	☐	27. Site Metering Tools
☐	☐	17. Directory Services	☐	☐	23. XML Tools	☐	☐	28. Software Distribution Tools
☐	☐	18. E-Mail	☐	☐	24. Desktop Videoconferencing	☐	☐	29. Data Warehousing
☐	☐	19. Groupware				☐	☐	30. Applications Development Tools
						☐	☐	31. Other Software/Applications

BUSINESS SERVICES

A	B		A	B		A	B	
☐	☐	32. Application Service Provider Services	☐	☐	33. Systems Integration/ Consulting	☐	☐	35. Other Services
			☐	☐	34. Education/Training Services	None of the above (1 – 35)		A B ☐ ☐ 36.

10. Please indicate the platforms that are currently installed/planned:
(check ALL that apply) A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

A	B		A	B		A	B	
☐	☐	01. TCP/IP v4	☐	☐	03. SNA/APPC/APPN/LU6.2	☐	☐	05. NETBIOS/NETBUEI
☐	☐	02. TCP/IP v6	☐	☐	04. Novell IPX/SPX	☐	☐	06. NFS
						☐	☐	07. Other Network Protocols

LAN/WAN ENVIRONMENT

A	B		A	B		A	B	
☐	☐	08. Gigabit Ethernet	☐	☐	13. Token Ring/Token Ring Switching	☐	☐	18. DSL
☐	☐	09. Switched Ethernet	☐	☐	14. Layer 3-7 Switching	☐	☐	19. ISDN
☐	☐	10. Fast Ethernet	☐	☐	15. FDDI	☐	☐	20. Frame Relay
☐	☐	11. Ethernet	☐	☐	16. Fibre Channel	☐	☐	21. Private Line T1, T3, OC-3, OC-12
☐	☐	12. ATM	☐	☐	17. Wireless LANs	☐	☐	22. Other LAN/WAN Environment

DESKTOP/SERVER OPERATING SYSTEMS

A	B		A	B		A	B	
☐	☐	23. Windows 2000	☐	☐	28. Intel based UNIX	☐	☐	34. Palm OS
☐	☐	24. Windows 95/98	☐	☐	29. RISC based UNIX (incl. SOLARIS)	☐	☐	35. Windows CE
☐	☐	25. Windows NT/Windows 2000	☐	☐	30. IBM MVS/VM/VSE/ESA	☐	☐	36. Other Network Operating System
☐	☐	26. Novell (NetWare 5.X, 4.X, 3.X, 2.X)	☐	☐	31. OS/400			A B
☐	☐	27. LINUX	☐	☐	32. Digital VMS	None of the above (1– 36)		☐ ☐ 37.
			☐	☐	33. Macintosh			

Continued on next page...

Continued from page one...

5. What is the total number of Servers/Clients installed/planned at your location/in your entire organization? (check ONE box in each column)

	SERVERS		CLIENTS	
	At Location (A)	Entire Org. (B)	At Location (C)	Entire Org. (D)
1.	☐ 50,000+	☐	☐ 50,000+	☐
2.	☐ 10,000 to 49,999	☐	☐ 10,000 to 49,999	☐
3.	☐ 1,000 to 9,999	☐	☐ 1,000 to 9,999	☐
4.	☐ 100 to 999	☐	☐ 100 to 999	☐
5.	☐ 50 to 99	☐	☐ 50 to 99	☐
6.	☐ 10 to 49	☐	☐ 10 to 49	☐
7.	☐ 1 to 9	☐	☐ 1 to 9	☐
8.	☐ none	☐	☐ none	☐

6. What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

A. Scope (check ONE only)

CORPORATE/ENTERPRISE:

1. ☐ Entire Enterprise/ Multiple Enterprises
2. ☐ Multinational Enterprise
3. ☐ Division/Multiple Divisions
4. ☐ Department
5. ☐ None

B. Involvement (check ALL that apply)

1. ☐ Create Network/IT Strategy
2. ☐ Recommend/Specify Brand
3. ☐ Approve Purchase
4. ☐ Evaluate Products/Services
5. ☐ Determine the Need
6. ☐ None

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7. What is the estimated number of employees in your entire organization/at your location? (check ONE in each section)

A. Entire organization:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 499 or less

B. At your location:

1. ☐ Over 20,000
2. ☐ 10,000 – 19,999
3. ☐ 5,000 – 9,999
4. ☐ 2,500 – 4,999
5. ☐ 1,000 – 2,499
6. ☐ 500 – 999
7. ☐ 250 – 499
8. ☐ 100 – 249
9. ☐ 99 or less

11. Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

A - Servers

1. ☐ IBM (Mainframes)
2. ☐ IBM RS/6000
3. ☐ IBM AS/400
4. ☐ Compaq/Digital/ Tandem
5. ☐ Unisys
6. ☐ H-P
7. ☐ Other

B - Workstations/Desktops/Laptops

1. ☐ Sun Microsystems
2. ☐ H-P
3. ☐ Compaq/Digital
4. ☐ IBM
5. ☐ Dell
6. ☐ Gateway
7. ☐ Fujitsu
8. ☐ Other

12. What is the estimated gross revenue of your entire company/institution? (check ONE only)

1. ☐ $20 Billion or More
2. ☐ $10 Billion to $19.9 Billion
3. ☐ $1 Billion to $9.9 Billion
4. ☐ $500 Million to $999.9 Million
5. ☐ $100 Million to $499.9 Million
6. ☐ $50 Million to $99.9 Million
7. ☐ $10 Million to $49.9 Million
8. ☐ $5 Million to $9.9 Million
9. ☐ $4.9 Million or Less
10. ☐ None of the above

13. For which areas outside of the U.S.A. do you have purchase influence? (check ALL that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ Africa
7. ☐ Canada
8. ☐ None

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■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Adventures in Bluetooth

Our editor discovers no wires doesn't mean no new hassles.

■ BY KEITH SHAW

The promise of Bluetooth? A simple way to connect devices wirelessly within a short range, making it an ideal technology for the home or small office. But based on our tests of some of the first generation of products, Bluetooth also promises to increase your volume of help desk calls as remote workers struggle with difficult installations and overly technical software.

NetworkWorld Review

You may have heard Bluetooth described as enabling a personal-area network (PAN), which is much smaller than a wireless LAN or WAN in terms of range and usage. Bluetooth devices operate in the 2.4-GHz frequency, the same as 802.11b wireless LANs and many cordless phones. Products transmit data within approximately a 30-feet range, at speeds of about 1M bit/sec.

Because the technology lends itself so well to remote and mobile environments, we were curious to see how easy (or difficult) it is to get various Bluetooth-enabled products to connect, or "discover" each other. We also wanted to see whether a remote worker with average technical knowledge could successfully set up a Bluetooth network, or whether IT would need to be called in.

The HP Deskjet 995c with integrated Bluetooth was quick to install, but prone to paper jams.

The players

For our test, we selected a sampling of devices from a wide number available. These include:

- Bluetooth PC Cards from TDK Systems and Troy Wireless for connecting notebook PCs. We installed the cards onto an IBM A31 ThinkPad with Windows XP. The laptop didn't have integrated Bluetooth, but had an integrated 802.11b wireless antenna.
- Compaq's H3870 iPaq Pocket PC for connecting a PDA. The device includes an embedded Bluetooth module.
- Widcomm's BlueGate 2100 access point for connecting Bluetooth devices to the Internet. The device includes an Ethernet port for connecting to a broadband modem or router. For this test, we only evaluated the Internet connectivity features, but the product also lets Bluetooth devices access a LAN.
- Troy's WindConnect print adapter. To let Bluetooth devices print, we attached the adapter to a Hewlett-Packard Laserjet 6L and HP's Deskjet 995c Laserjet printer, which contains an embedded Bluetooth module.

We didn't test Bluetooth-enabled mobile phones, but travelers might find them useful. Connecting a PC via Bluetooth to a mobile phone that can dial out on a next-generation wireless network will be a heavily used application. In the U.S., Bluetooth-enabled phones are starting to appear, including Sony Ericsson's T68 model.

See Bluetooth, page 28

Net Results

H3870 iPaq Pocket PC with integrated Bluetooth

Company: Compaq. **Price:** $650. **Pros:** Preinstalled Bluetooth software; discovered some Bluetooth devices easily. **Cons:** Failed to discover the access point; discovered the printer, but failed to transmit a print job.

Bluetooth PC card from TDK Systems

Company: TDK Systems. **Price:** $135. **Pros:** Easy setup; good software. **Cons:** May be difficult to buy in U.S.; updated driver required for Windows XP compatibility.

WindPort Bluetooth Wireless PC card

Company: Troy Wireless. **Price:** Between $125 and $150. **Pros:** Works well with Troy Wireless' WindConnect printer adapter. **Cons:** Somewhat difficult to set up.

BlueGate 2100 access point

Company: Widcomm. **Price:** $800. **Pros:** Allows wireless Internet access without setting up an 802.11b network; worked well. **Cons:** Intermediate-level setup required; no printed documentation; expensive for SOHO environments.

Troy Wireless Wind Connect printer adapter

Company: Troy Wireless. **Price:** Between $150 and $200. **Pros:** Good way to Bluetooth enable an existing printer; less expensive than buying an integrated Bluetooth printer. **Cons:** Somewhat difficult to set up.

HP deskjet 995c with integrated Bluetooth

Company: HP. **Price:** $400. **Pros:** Good color printer; quick installation. **Cons:** Paper jammed often; expensive if Bluetooth is all you're after.

Short Takes

■ **Mitel Networks** recently introduced the **Mitel Networks 3050 Integrated Communications Platform.** Geared to offices with up to eight users, the product provides integrated voice and data, wired and 802.11b wireless LAN, IP telephony, router, firewall and VPN. ICP includes a Web server, collaboration tools and Web management. The platform is built using a combination of Linux, IP and Session Initiation Protocol, a real-time communication protocol for IP voice, video and instant messaging that is gaining momentum. ICP will be available in November and costs about $2,000 for a three-phone setup. www.mitel.com

■ **Linksys** recently debuted the **EtherFast Cable Modem.** Based on DOCSIS 1.0 and upgradable to the 1.1 specification, the modem includes a Universal Serial Bus and Ethernet port. SNMP monitoring lets service providers remotely download upgrades and troubleshoot problems. Available now, the modem costs $130. www.linksys.com

■ Several home entertainment companies — Kenwood, SONICblue, Ucentric Systems, Turtle Beach and Escient Convergence — recently announced they will use **HomePNA** technology to distribute digital audio and video content throughout the home. Currently, HomePNA provides 10M bit/sec speeds. Version 3.0, expected in the fall, will provide 100M bit/sec. Essential for entertainment applications, HomePNA provides quality of service for prioritizing data, audio and video traffic delivery. www.homepna.org

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Bluetooth

continued from page 25

Getting to know you

With the exception of the iPaq, each product we tested required that we install software and, in some cases, drivers on our notebook PC. Because Compaq's Bluetooth Manager already was on the device, activating Bluetooth on the PDA was a simple matter of clicking a menu item called "Turn radio on."

Installing the Bluetooth PC Cards on the notebook was as easy; just insert the card into the PC Card slot and install the driver from the CD-ROM. Using Windows XP made it easier because the operating system is Bluetooth-friendly. Setting up the access point and both printers took considerably longer because we had to install printer drivers and configure network connectivity.

Once we got all the devices set up and within range, we used the software on the notebook to discover another Bluetooth device. While you need to initiate this process manually, discovery doesn't require line of sight between devices. At this point, the software sends a signal looking to see whether any Bluetooth devices are in range. On returning a list of "found" devices, you simply select the one to which you want to connect.

Once we got two devices to discover each other, we found there really isn't too much they can do. When you're connecting, for example, a PC to PC, or a PC to PDA, you can share files or exchange "business cards," similar to beaming your contact information onto a PDA.

More specific devices (such as the access points and printers) contain "profiles" that let you connect to the Internet or print a document. Once the software discovers the other Bluetooth device, you then choose the service you want to activate. Depending on your needs, this could involve one step (connect to access point for Internet) to up to three or four steps (initial connection to the printer).

Easy for whom?

Your remote workers will be comfortable installing a Bluetooth PC Card and any accessory that connects to a PDA. But for connections to a Bluetooth access point or a printer, the IT department will probably want (or need) to get involved.

Take for instance the installation of the Bluetooth access point. It required that we plug the device into our Ethernet connection, locate the access point's media access control (MAC) address (which in this case was affixed to the access point but required removal of the plastic case), and input the address on a different networked computer to find its IP address. We had to install the software on the notebook so it could discover the access point. While some remote workers are comfortable with this level of technical installation, they're the minority. Moreover, when it comes to tweaking IP address and MAC addresses, many IT departments want to handle it themselves to avoid trouble down the road.

Bluetooth printing frustrated us even more. Not only did we have to follow the discovery steps, but we also had to ensure the printer was connecting via the correct COM port. The Troy printer adapter software had us installing virtual COM ports — an exercise that could push remote workers and many an IT administrator to throw the notebook against the wall. The documentation was of no help, by the way.

Last, we learned the Bluetooth software that some companies provide is still bogged down with unfriendly technical terms that could intimidate your remote workers, and some pretty unintuitive interfaces. Even something as simple as finding where we transferred a particular file often involved several clicks on the software. ■

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Short Takes

■ **Sendmail** last week announced a group calendaring and scheduling software package designed for mobile devices. Sendmail Calendar Server lets enterprise customers of Sendmail's back-end Internet e-mail routing and hosting software offer their end users Web-based and wireless access to calendar information. It supports some aspects of a calendaring and scheduling protocol under development by the Internet Engineering Task Force. The IETF Calsched protocol will let users share calendaring information over the Internet regardless of the calendaring or scheduling package their companies used. Sendmail Calendar Server runs on Sun's Solaris operating system and will soon be available for Linux. It costs from $2 to $15 per user, depending on the number of users. www.sendmail.com

■ **Network Instruments,** a maker of network performance management software and protocol analysis tools, this week will release **Observer 8.1.** Network Instruments has integrated a complete set of wireless troubleshooting and measurement tools into the Observer product line, providing support for Wireless 802.11, Ethernet, Token Ring and FDDI LANs in one package. Users install Observer at a Microsoft Windows workstation and probes at wireless access points. Customers can collect information about signal quality, wireless performance. Users of Observer 8.0, released in October 2001, can receive the wireless features at no extra cost. Pricing for Observer 8.1 is $1,000. Expert Observer costs $2,900, and the Observer Suite costs $4,000. www.networkinstruments.com

■ **Microsoft** last week released a patch for a security hole in its SQL Server 7.0 and 2000 databases that could let attackers execute code of their choice on an affected system by exploiting a buffer overflow vulnerability. For more information see www.Microsoft.com/technet/security/bulletin/ms02-020.asp.

Honeynet looks to sting hackers

■ BY ELLEN MESSMER

A group of 30 computer security researchers who set up inexpensive "fake" networks to observe how hackers behave as they break into them are finding out about new software vulnerabilities and warning the public.

The security professionals, calling themselves The Honeynet Project, quietly maintain a distributed network of Windows NT, Linux, Sun Sparc servers and desktops accessible via the Internet to monitor how hackers go after various operating systems. As research volunteers operating on a shoestring, they've collected a wealth of data — and at times found out about new attack tools and exploits of the "blackhat" underworld of hackers.

In January, for instance, the Honeynet Project discovered hackers could use a management feature called the CDE Subprocess Control Service to take root control of Solaris.

The Honeynet Project shared that insight with the CERT Coordination Center, which determined the matter was serious enough to issue security alerts advising Solaris users to turn off CDE until the buffer-overflow vulnerability was patched.

But most days, according to Jed Haile, project engineer at Nitro Data Systems and volunteer hacker-watcher, the Honeynet records hacker activity that is of less scientific interest but is astonishing in its intensity and criminality.

Hackers that fall into the Honeynet are seen to swap stolen telephone and credit card numbers, try to break into other possibly more "real" networks and even discuss using the Internet for terrorist attacks.

In general, experience shows that hackers frequently operate as gangs — and they love to talk.

"The 'blackhats' have a compulsive need

See Honeynet, page 34

Not so sweet honey

The Honeynet Project was set up to trap, monitor and record hackers. Also known as deception systems or honeypots, such networks are designed to look like real networks with real resources to attack. The driving ideas behind honeypots are:

- Help other users and the industry with early warning and prediction data.
- Identify new hacking tools and tactics.
- Provide forensic evidence to post-attack investigators.

U.S. Navy pares down paper stash

Enigma software helps the Navy organize manufacturers' tech documentation.

BY ANN BEDNARZ

BOSTON — The U.S. Navy is taking steps to digitize some of its technical manuals, saving thousands of dollars in printing costs and making it easier for repair technicians to access the documentation they need.

Naval engineers charged with repairing hovercraft vessels once had to reference gargantuan paper manuals and flip between engineering diagrams, parts catalogs and service bulletins to do the job. Now the Navy is working to consolidate its hovercraft maintenance resources and make them available for delivery on CDs and over the Web. It's doing this with the help of software maker Enigma.

No more heavy lifting: Naval technicians who repair hovercraft can now reference digital files instead of 450-page paper manuals to get the service materials they need.

Enigma calls what it does asset life cycle management. The company sells its software to manufacturers that sell complex capital equipment and to large companies that buy and operate such equipment. For manufacturers including GE Aircraft Engines, Pratt & Whitney and Perkins Engines, Enigma helps capture after-market sales of replacement parts and service revenue. For organizations such as the Navy, Enigma helps manage product maintenance content from multiple vendors. Enigma's competition is largely homegrown systems and, to some degree, product life cycle management software.

The Navy's work with Enigma is under way at Boston Planning Yard, a division of the Puget Sound Naval Shipyard. So far it is confined to the Navy's hovercrafts, formally known as landing craft air cushion (LCAC). These amphibious landing craft, which can carry up to 75 tons, transport weapons systems, equipment, cargo and personnel from ship to shore.

Home base for 90 LCACs, Boston Planning Yard is responsible for disseminating LCAC maintenance and repair information to Navy technicians around the world. Part of what makes that task complicated is that the Navy has several LCAC models, built under different contracts and often with only slightly different hull designs, says Bill Kone, a supervisory mechanical engineer at Boston Planning Yard. This translates into thousands of pages of manufacturer-provided product support documentation that Kone's group needs to maintain and distribute to far-flung users.

Paper blizzard

In total, Kone is responsible for 120 manuals, averaging 450 pages each. His team so far has converted 75 manuals to Enigma's 3C Platform, a Web-based application that lets the Navy pull together a range of technical documentation from disparate sources, including repair and maintenance manuals, parts catalogs, service bulletins and repair histories.

U.S. Navy, page 34

Configuresoft boosts admin. controls

ECM 4.0 introduces delegation features, change management, compliance module.

■ BY JOHN FONTANA

Configuresoft this week will add a number of enhancements to its configuration management software designed to help companies control who can use the software and how, and to support automatic updates to configuration settings.

With Enterprise Configuration Manager (ECM) 4.0, the company is introducing role-based permissions. The permissions add a delegation control, in that an administrator or group of administrators can be assigned a role that dictates how they can use the software. A database administrator's role would limit use of ECM to monitoring configurations on databases only. Or an executive could limit access only to the reports generated by ECM.

Previously, ECM let anyone using the software access every server and desktop on the network.

"Now I have much more flexibility, and I can decide what administrators can see and do based on the groups they belong to," says Tony DeVoto, Windows NT systems administrator for Volvo Finance North America, the lending division for the automaker. Volvo Finance has separate IT groups for development, quality control and production. With 4.0, DeVoto confines those groups to the machines that they control. "Now we can put more people to work with this tool," he says.

Configuresoft is adding a change management feature that allows for single-click changes to system and security configurations. Also new are a full-featured, Web-based interface, built-in support for Crystal Reports, and a compliance module that monitors and maintains standard configurations on servers and desktops.

ECM works by placing a Distributed Component Object Model-based agent on each machine in the network that in turn sends information to a centralized database. With the configuration data, administrators can track things such as security settings.

With Version 4.0, administrators can not only track configuration settings, but also can change them on a single machine or group of machines with a mouse click. Users can change event log settings; create, modify or delete Windows Registry keys; and change passwords or modify user rights.

Configuresoft also has replaced its read-only Web-based client with a full-function Web-based interface and added a compliance module that lets companies ensure that all machines comply with set configurations.

ECM competes with BindView, Ecora and Aelita.

Enterprise Configuration Manager 4.0, which runs on Windows NT/200, is expected to ship next month. Pricing starts at $1,000 per server and $30 per desktop.

Configuresoft: www.configuresoft.com

Honeynet

continued from page 33

to chat on IRC [Internet Relay Chat software]," says Haile, who spoke about the two-year experience of The Honeynet Project at the recent InfoSec conference. "The first thing they'll do on a hacked box is set up IRC and invite their buddies over." Then they set up an encrypted route back to another compromised server elsewhere on the Internet.

The goal of the Honeynet Project, started by Sun engineer Lance Spitzer, is not to capture hackers, but to observe their actions and find out about new tools they use.

"A lot of these hackers are not gurus who know everything about computers," Haile says. "They have very good tools. And they talk about doing this for money. There's definitely a market for hired hacking out there."

The Honeynet Project's undisclosed number of servers and desktops, maintained at diverse locations with a minimum of publicity, spans the country. Each server typically gets 20 or more unique scans per day, and the hackers don't have too hard a time breaking into any operating system that isn't up to date on its patches, although they may find new vulnerabilities, too.

As a scientific effort, one of the Honeynet Project's goals is to analyze the collected data to develop software that can detect the probability of a successful attack. The Honeynet Project also would like to be able to pinpoint those who make these hacker tools.

Even as it learned a lot about hackers, the Honeynet Project discovered there are practical obstacles in operating a honeynet, especially in making sure a hacker doesn't use the honeypot as a springboard to break into other systems.

"Suppose hackers break into a honeynet during the weekend and they take down the White House?" Haile says. "There's a tremendous legal liability in all this." If an attacker makes more than five or six outbound attempts at attacks, the honeynet shuts him off. Hailer says no company should set up a honeynet of its own before discussing it with its legal department.

The Honeynet Project has designed a second-generation honeynet that will include an extensive "production-looking" intranet to keep hackers intrigued with trying to break in further. But it will block outbound scanning.

Hackers tend to be an angry lot, particularly when they figure out they are being watched in a honeynet, Haile says. "Hackers will undertake every effort to destroy a honeypot when they find it." ■

More online!

Check out a honeypot in action.

DocFinder: 9036

Marimba ups its desktop mgmt. suite

■ BY DENISE DUBIE

MOUNTAIN VIEW, CALIF. — Marimba last week pumped up its desktop and mobile management software suite to help users more easily schedule upgrades to remote machines and generate near real-time reports.

In addition to giving users more flexibility in scheduling upgrades, Marimba added advanced Web-based reporting to its product suite. About a year ago, Marimba added Web management capabilities to its product portfolio, and the company now is now letting users take advantage of a Web interface to generate reports.

Also new in this release is a browser-based management portal that the company says makes it easier for systems administrators to install, configure and manage software distribution. Marimba enhanced its Java-based tools with Java 2 Platform Enterprise Edition technologies, including JavaServer Pages and XML.

The company says the Java technology will help Marimba software integrate with current and future third-party products, such as Web services management tools.

Available immediately, pricing for Marimba's Change Management product families begins at $30,000 and varies based on number of endpoints and network configuration. Customers with existing maintenance agreements will receive the release at no additional charge. ■

U.S. Navy

continued from page 33

Available over the Internet, the technical manuals are organized by model so that once a technician keys in the appropriate vessel, the software, through XML-based transactions, links related information. A technician can view a diagram and click on a hyperlink to open a new window containing specifications for a particular part, for example. "It's not scrolling," Kone says. "Everything opens in separate windows so we can see more than one thing at a time."

Easy navigation streamlines parts identification and reduces ordering errors, Kone says. Technicians quickly can find the data they need, instead of sorting through stacks of hefty manuals. As for productivity gains, "you can't put a number on it, but it's the difference between night and day," Kone says.

Making life easier

The process makes Kone's job easier, too. Before Enigma, making a change to an existing manual required the team to not only provide the new content but also match the fonts, style and page layout of the original book — it was not unusual to spend a day formatting one page, Kone says. The process was "cumbersome and agonizing," he says. Now Enigma polices the formatting of documents, which are laid out hierarchically according to Navy guidelines, and makes sure writers and editors adhere to proper document structures. "Lights out editing," Kone calls it.

Distribution is improved, too. Before Enigma, Kone had to allow two months from the time a book was finished to get it in the technicians' hands. Now his team can put materials on a Web server as soon as they are approved. Recall notices that used to take up to six weeks to reach every technician in the fleet now are published to the Web in two or three days.

"We've probably picked up a month-and-a-half on our distribution cycle," Kone says. Kone is saving the $2,000 it costs to print each manual.

Down the road, Kone plans to link the digital manuals to a procurement system, so that after identifying the proper part, technicians can check pricing and availability, and order parts from within the same environment. "We want to be able to link everything the books are used for into a single program," Kone says.

Enigma: www.enigma.com

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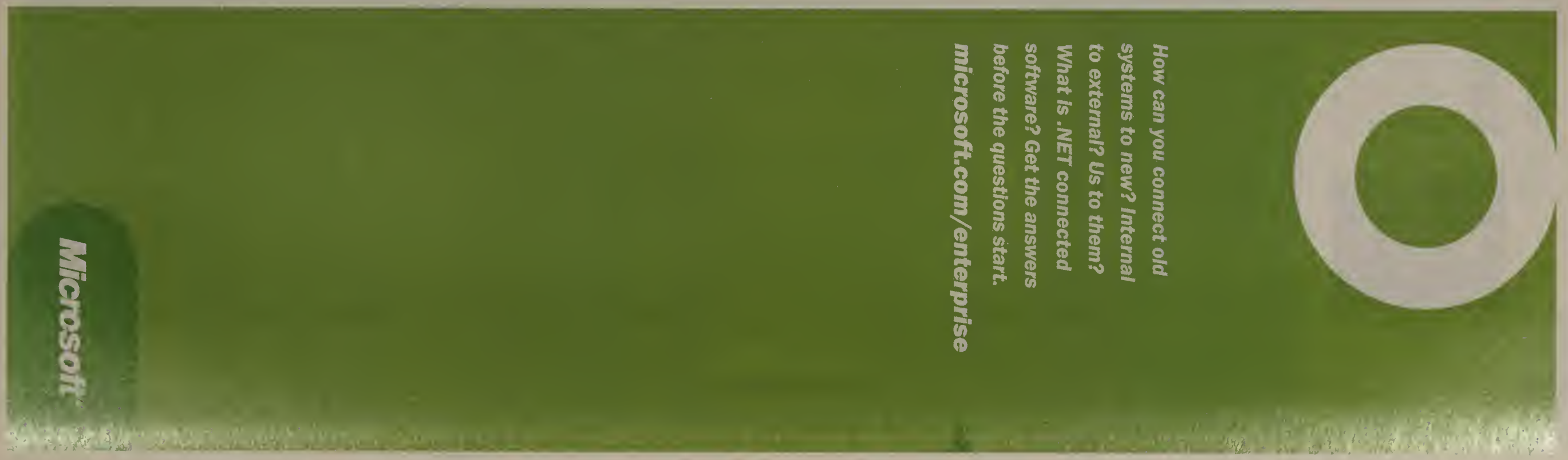


'NET INSIDER

Scott Bradner

Instant messaging: The problems of success

Instant messaging is coming on like gangbusters in enterprise networks, and with its success come some of the burdens of that success. Burdens that include deciding whether to monitor or archive messages and the disruption of organizational boundaries.

The No. 2 link under "other top news" on the CNN.com Web site last week was a story titled "Interest in IM monitoring on the rise." The story's subtitle was "Instant messages aren't always fleeting."

The story was mostly about companies starting to realize that they need to start treating instant messages like e-mail when it comes to corporate policy. If the corporation archives all e-mail to and from employees, maybe they should do the same with instant messages, which are starting to replace e-mail and phone calls in a number of organizations.

Note that an organization may well want to think quite hard about archiving all instant messages, just like they should have thought about archiving all e-mail messages. Ask Bill Gates how much fun it was to be asked during his depositions about e-mail he had sent in a fit of peak years before. If you do not archive the e-mail, then you cannot be forced to produce it if you manage to get embroiled in a lawsuit some time in the future.

I'm not a real fan of the archiving of employee communications. It seems to be just another dehumanizing step along the path toward corporate ownership of employees and a potential gold mine for opposing attorneys. But I do understand that some employees are not ideal corporate or real-world citizens, and at least some monitoring too often is warranted, but I'd personally rather that one of the key-word scanning tools be used than that all e-mail, and instant messages, be saved forever. These tools can scan for things such as "guaranteed profit" in e-mail sent by brokers to their clients and archive (and block) those letters.

Instant messaging is continuing the flattening of organizational structures that e-mail started. It's just too easy to send an instant message to anyone bypassing "normal" hierarchies.

Another story on CNN.com a few days ago explored the use of instant messaging in the U.S. Navy, where sailors are sending messages between themselves, even when they are in different ships, and sometimes navies. The navies of the U.S., Canada, the U.K., Australia and Germany all use the same instant messaging software.

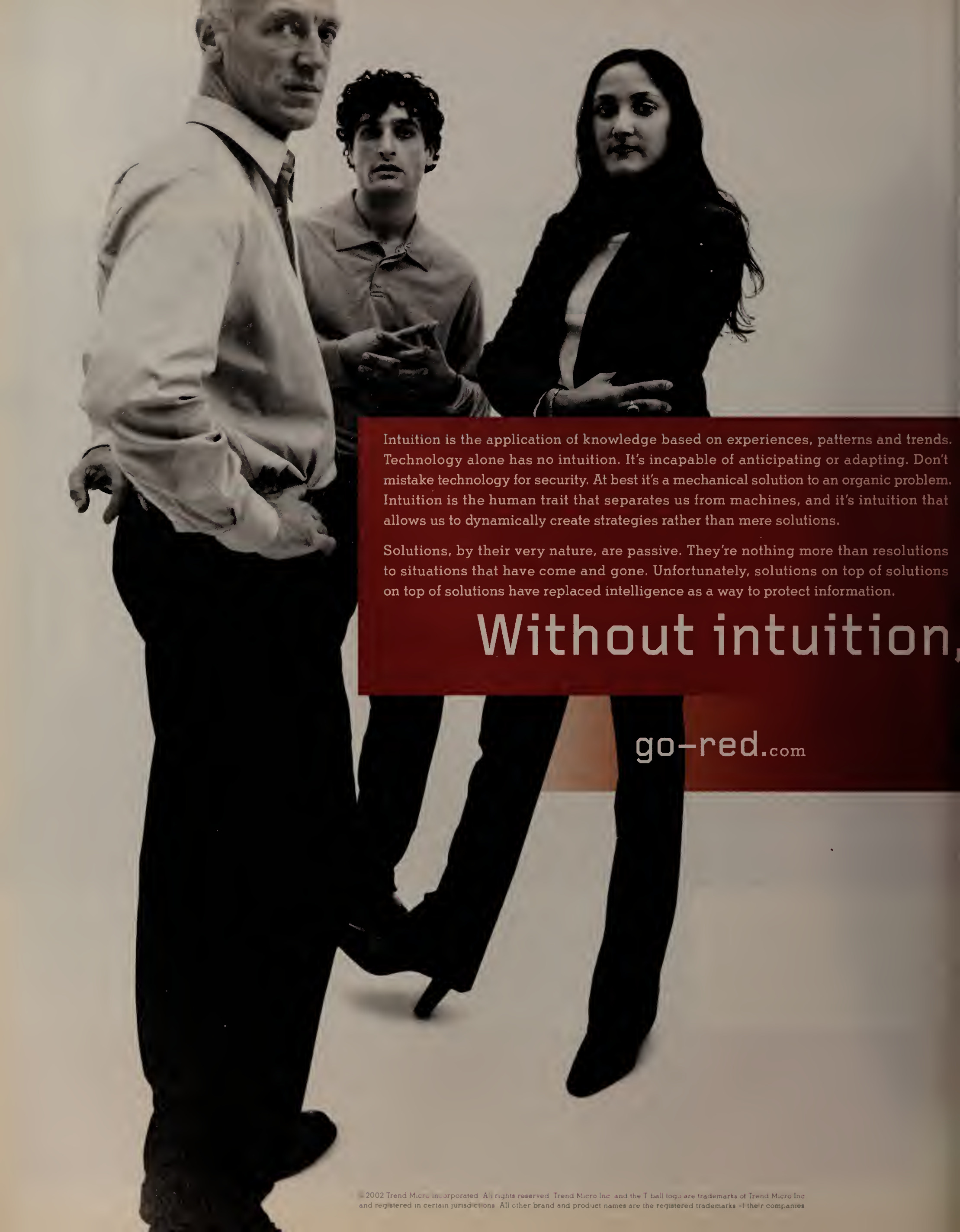
The writer seemed to think that cutting through the chain of command was a good thing, but I'm a bit worried about the security implications of a supply clerk telling someone he thinks is a supply clerk in another ship that they are stocking up on MREs.

The use of instant messaging in business is yet another case where real change has happened without the involvement of corporate planners because of the ease of innovation over the Internet. People just started using it, and the planners are only starting to catch up. This is not the last time this will happen. (In case it's not clear, innovation is a good thing.)

Disclaimer: Because "instant" and "Harvard" are not related concepts the above is my own ramble.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

intuitive information security



Intuition is the application of knowledge based on experiences, patterns and trends. Technology alone has no intuition. It's incapable of anticipating or adapting. Don't mistake technology for security. At best it's a mechanical solution to an organic problem. Intuition is the human trait that separates us from machines, and it's intuition that allows us to dynamically create strategies rather than mere solutions.

Solutions, by their very nature, are passive. They're nothing more than resolutions to situations that have come and gone. Unfortunately, solutions on top of solutions on top of solutions have replaced intelligence as a way to protect information.

Without intuition,

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information is naked.

Intuition leads to innovation. Not simply to solutions, but innovative technologies able to deliver and execute intelligent strategies. Technology itself must constantly be questioned, analyzed and expanded in directions that are yet to exist. Using intuition to anticipate the future is the only way to secure information in the present.

Identifying new viruses, finding malicious code and logging security breaches are no longer enough. *Intuitive Information Security* is the melding of innovative technology and human intuition so that unique strategies can be applied to ever-changing problems. Strategies that are deployed by tools able to understand where information is vulnerable and how best to protect it. From the desktop to the file server. From the email server to the Internet gateway. From the home PC to wireless devices — everywhere there is information.

Some may not believe that this is possible. But to those who do, a new level of information security will emerge. One that is proactive rather than reactive. One that uses intuition and technology to do what was once done manually. And most important, one that allows the emphasis to change from packaged solutions to evolving, intelligent strategies.

Intuitive Information Security is as much a philosophy as it is a technology. Without intuition, information is naked. To accept this simple principle is to embrace the philosophy of go–red. And it is the basis of all of our products and services.

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intuitive information security

Special Focus

LDAP: Improving access to enterprise applications.

Directory standard at a crossroads

■ BY JOHN FONTANA

In the spring of 1997, then University of Michigan student Tim Howes walked into a roomful of software vendors gathered on campus and detailed a standard directory access protocol he had helped develop as part of his master's degree work.

By that fall, the protocol had broken out of academia, and every directory vendor had committed to adopting Lightweight Directory Access Protocol (LDAP), a standard for querying and updating a directory and an answer to the failures of X.500's overweight Directory Access Protocol.

Today, LDAP Version 3 (LDAPv3) is the foundation for a centralized enterprise directory available to any application.

Every directory vendor supports LDAP, and there are thousands of LDAP-compliant products that act as clients to those directories. The protocol has become the standard used throughout large companies to access directory information about users and resources.

"That meeting was definitely a watershed," says Howes, now CTO for managed service provider Loudcloud, speaking about the meeting in 1997. "Directories couldn't work without our client. The market was screaming for a standard client protocol."

But LDAP is clearly at a crossroads. Developers of the technology have answered the need for a standard way that clients can access a directory, and LDAP has cemented itself in corporate networks.

"LDAP has provided a lowest common denominator and the simplest way for us to get to the directory," says John Prince, core technology manager for connectivity at Conoco. The company relies on the protocol to make its directory available to other applications.

But Prince, like others, has been waiting for LDAP to standardize directory integration.

What LDAPv3 lacks is widely adopted access control and back-end integration extensions, such as replication, which are needed to integrate disparate directories and build a distributed directory service. Today, metadirectories solve that issue within a company, but the problems have mostly trapped LDAP behind the firewall. Experts say it will take help from emerging technologies such as XML to solve it.

LDAP and beyond

Lightweight Directory Access Protocol is no doubt the most important advancement in creating standard access to directories, but other work still needs to be done. Here is a list of some current activity related to LDAP and directories.

Internet Engineering Task Force:

LDAPv3 revision (LDAPbis) — A working group will deliver revised LDAPv3 "core" specifications (RFCs 2251-2256 and 2829-2831) suitable for consideration as a draft standard.

LDAP Duplication/Replication/Update Protocol (LDUP) — Chartered to standardize master-slave and multimaster LDAPv3 replication. Recently inherited access control model work from the LDAP extensions working group.

Organization for the Advancement of Structured Information Standards:

Directory Services Markup Language (DSML) — Version 2.0, set for approval this summer, is basically an XML representation of LDAP with batch request and delete operation added.

Security Assertion Markup Language (SAML) — An XML-based security standard for exchanging authentication and authorization information across security domains. Could eliminate need for standard directory replication and synchronization. Other work: W3C, XML Signature, IETF, BEEP.

Extensible Access Control Markup Language (XACML) — An XML specification for expressing policies for information access over the Internet. Could provide standardized access controls. Other work: W3C, XML Key Management Specification.

The Open Group:

Directory Interoperability Forum (DIF) — A virtual global forum promoting open and interoperable directories and their adoption by industry. Also provides testing and certification for applications and servers.

Back to the drawing board

The Internet Engineering Task Force (IETF), the standards-body caretaker of LDAP, is working on resolving the protocol's lingering issues.

The IETF last month appointed an executive committee to review a backlog of 65 submissions for LDAP extensions. The IETF also suspended work in the LDAP extensions working group and moved its work on an access control model to the group working on LDUP — the LDAP Duplication/Replication/Update Protocol. LDUP is designed to provide a standard method for server-to-server and server-to-client replication. Secure access control is important when directories talk directly to one another to exchange information.

"Replication and access control are the two big-ticket work items but will take some time to see completion," says Kurt Zeilenga, co-chair of the LDAP Revision working group that is polishing the LDAPv3 specification to address ambiguities. "But LDAP is alive and well. There is untapped potential around LDAP, and we are moving into some interesting areas."

He says ongoing work in the IETF on authentication and security protocols, including the Simple Authentication and Security Layer and Start Transport Layer Security, will benefit LDAP.

But some observers say LDAP has stagnated, as evidenced by the fact that the LDUP group has not produced a standard during the past three years and that XML may be what provides the pieces LDAP has not.

"It is obvious that XML has become the way to exchange data in the future, and it's obvious that LDAP may have to take a back seat or go away at some point," says Dave Kearns, an independent consultant and *Network World* columnist.

LDAP now shares the stage with Directory Services Markup Language (DSML), an XML clone of LDAPv3. Directory vendor iPlanet already has its XMLDAP Gateway, which allows developers to build applications that use DMSL to perform LDAP operations.

Furthermore, emerging XML standards, such as Security Assertion Markup Language (SAML) and Extensible Access Control Markup Language, may supply access management features to complement LDAP and DSML, and eliminate the need for directories to replicate data to each other before they can interact.

"LDAP is not dead, but it has hit a plateau and will stay there a long time," says Daniel Blum, an analyst with The Burton Group and another *Network World* columnist. "We don't think the access control work will gain a lot of adopters because there are too many vendors with their own mechanisms."

XML may hold some of the answers.

DSML 2.0 provides a natural affinity with other XML work.

"We're excited about DSML. It puts LDAP in a protocol and coding [XML] that is everywhere," says Winston Bumpus, co-chair of the DSML working group and chairman of the Directory Interoperability Forum. "Small mobile devices won't need LDAP: They can use XML and Simple Object Access Protocol to communicate."

Others say that XML will fill other LDAP gaps.

"I think you will see more XML-based integration techniques adopted than LDAP extensions," says Patrick O'Kane, chief architect of ePresence, a systems integrator focused on directories. He says XML on the whole is being touted as the technology to integrate back-end systems, including the directory.

XML protocols, many not directly related to directory operation, may function a layer above the directory, to link access management servers, for example. In that case, those servers use XML to exchange preapproved authentication and authorization data pulled from the directories they are connected with using LDAP. The LDAP-compliant directories never talk to one another and don't require compatible access controls, replication or schema, which describe the directory structure.

It's less about integrating at the directory layer and more about integrating software that relies on a directory.

Emerging XML protocols such as SAML help foster that software integration, experts say.

"SAML can assert that authentication of a user has occurred and insert privileges. It assumes the receiver can consume SAML without having to know schema or protocols used by the sender's directory," says Jamie Lewis, president of The Burton Group.

LDAP requires that knowledge.

But he warns that SAML has schema and syntax issues of its own and that identity management systems such as Microsoft Passport or Sun's Liberty Alliance also have to be part of the mix.

"But SAML is a more loosely coupled environment. It won't be dressing up LDUP in XML," Lewis says.

Another important factor may be XML's path to the Internet. Companies typically open Port 80 to let data flow to the Internet. XML data passes through Port 80 on the back of HTTP. LDAP on the other hand uses Port 389, a port many IT executives are willing to open on their firewalls.

"The attraction to XML is that it runs over Port 80," says Jackson Shaw, lead product manager for Microsoft's Active Directory. "Companies that have that port open have tools to do content inspection on that port, not Port 389." ■

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XO launches cheaper Ethernet options

'Unprotected' services are targeted at cost-conscious businesses.

■ BY MICHAEL MARTIN

XO Communications this week will introduce what it calls "unprotected" Ethernet services designed for business customers who want metropolitan or intercity Ethernet but don't need the highest level of reliability and its associated cost.

The financially troubled competitive carrier also will unveil Fibre Channel and Enterprise Systems Connection (ESCON) transport options for metropolitan-area networks (MAN).

XO already offers a suite of Ethernet and wavelength services for large business customers (see chart).

But not all customers require the 99.999% availability guarantees that come with XO's existing offerings, says Garrett Hess, XO's senior product manager for Ethernet services.

XO's unprotected Ethernet services, available at 100M bit/sec and 1G bit/sec, give customers less redundancy but still include a 99.99% availability service-level agreement. By losing a nine from their reliability, customers will save from 30% to 50% off the cost of a comparable higher-grade service, Hess says.

"You still get guaranteed port-to-port bandwidth," he says. "You still get an Ethernet handoff. And there's still no customer-premise equipment cost, and XO manages the service from end to end."

Ron Kaplan, an analyst with IDC, says unprotected Ethernet services will appeal to cost-conscious companies and to businesses looking for a back-up service.

However, the overall market for Ethernet services in the U.S. isn't huge. In 2001, IDC estimated the market at $151 million and predicted it would grow 36% per year for the next five years.

XO is hoping to tap into the demand for storage services by offering Fibre Channel and ESCON traffic options over Ethernet. Fibre Channel and ESCON support will be limited to protected Ethernet services and will only operate within MANs.

Winning customers with new services might be the least of XO's concerns though.

The company is struggling under a debt burden of more than $5 billion and has been rumored to be on the verge of bankruptcy for months.

In January, XO reached an agreement with billionaire Ted Forstmann, who already holds a 22% stake in the company, and partner Telefonos de Mexico, that would see the two each invest $400 million. In return, each would get a 39% stake in the company and XO's debt holders would restructure the debt.

In March, the company was rumored to be on the verge of filing for Chapter 11 bankrupcty, with the intent of re-emerging as a restructured firm under Forstmann and Telefonos de Mexico. However, a group of investors, led by billionaire Carl Icahn, was fighting the restructuring, arguing that investors were not getting a good deal.

Last week XO issued a statement saying it is still working on restructuring its debt and negotiating with the Icahn-led group.

"I think the financial situation is a concern," Kaplan says. "People are wary of [competitive local exchange carriers] in general, and XO's specific problems won't help them either."

However, Kaplan adds, many companies who rely on CLEC services are large companies that buy services from more established telecom players as well. The CLEC offerings give these companies network redundancy and aren't a real risk, because if the CLEC runs into trouble, the large customers can rely on circuits from their other providers.

XO: www.xo.com

Big bandwidth options

XO's existing Ethernet and wavelength services include:

Ethernet

- 10M, 100M and 1,000M bit/sec connections.
- A fully managed service, including customer premises equipment.
- An SLA of 99.999% on availability and network performance.

Wavelength

- Metropolitan waves up to OC-48.
- Intercity waves up to OC-192.

Short Takes

■ **Tachyon** recently introduced its **Mobile Network Access** satellite service, which offers portable broadband access. The service is designed for users that need high-speed Internet access for special events, construction sites or other temporary locations. The service includes a Tachyon network router, a 1.2-meter-diameter satellite dish, a radio, shipping cases and cabling. The Mobile Network Access service is available in the U.S. and costs $600 to $2,000 per month for a T-1, 1.544M bit/sec, wireless connection. **www.tachyon.net**

■ Capital spending by North American telecom carriers probably will not recover until 2004, research company RHK says. And even after the recovery, carriers as a group, including incumbent and competitive telecom service providers, likely will not return to 2001 spending levels until about four years from now. The most likely scenario shows capital expenditure staying roughly flat through 2003 before it begins to recover in 2004. Service providers' capital expenditure will drop to around $46 billion to $51 billion in 2002, from $77 billion in 2001, RHK says. It projects spending also to stay roughly flat through next year, from $44 billion to $57 billion for 2003. A recovery probably will begin slowly in 2004, with spending from $46 billion to $63 billion, and continue in 2005 and 2006.

Teleglobe moves to unify managed data services

■ BY DENISE PAPPALARDO

Teleglobe Communications is simplifying its managed data services by offering a single device that it claims is easy to upgrade as well as cost-effective.

This week the multinational carrier and Quick Eagle Networks are expected to announce that Teleglobe is rolling out the vendor's 4200 Intelligent WAN Access device to its managed private line, ATM and some dedicated IP VPN customers.

"We liked these products because of their remote monitoring and reconfiguration capabilities," says Greg Ewert, vice president of marketing at Teleglobe. "We can upgrade the devices without calling out a technician to the premise to reconfigure the box."

Previously, Teleglobe was using devices from several vendors to support its managed data-service offerings, Ewert says. The carrier plans to use the Quick Eagle device for nearly all its managed data services.

Using a single vendor's product to support all its managed data-service customers also will make it easier for Teleglobe to launch new and enhanced services, says Liza Henderson, a vice president at consulting firm TeleChoice. Because this device can be upgraded remotely, Teleglobe could easily add features such as bandwidth management, she says.

Teleglobe also will deploy the Quick Eagle device for customers with a location connected to their corporate WAN via another provider's frame relay network. Teleglobe does not offer frame relay services directly, but does offer customers frame-to-ATM interworking for cases in which a customer has a site in a country where Teleglobe doesn't offer service.

"Many large enterprises are relying on service providers to help reduce operating expenses," Henderson says. "It's easier and many times more cost-effective for users to buy a managed service from a service provider than it is to hire, retain and train a staff."

For this reason, Teleglobe's use of Quick Eagle's access devices will be especially attractive to businesses that have a large number of locations, she says. ■

More online!

See how Teleglobe is using the 4200 access devices to simplify management and monitoring.

DocFinder: 9035

EYE ON THE EXPERTS

Johna Till Johnson

IP VPNs: When, where and why

Every few years the concept of IP VPNs gets a lot of press. The idea is simple: A company can use one infrastructure (an IP network) to connect branch offices, headquarters, remote users, and third parties such as suppliers and customers.

Yet most large organizations continue to use a patchwork of frame relay, ATM and remote-access services to handle these needs.

If IP VPNs are such a great idea, why haven't more companies taken advantage of them?

Two reasons: the state of the technology and the maturity of most enterprise organizations. In this column and the next, I'll explore the basic concepts of IP VPNs, discuss where and when they're effective, and cover the anticipated evolution of the services.

There are three basic flavors of IP VPNs, each with an associated set of business requirements and technology enablers.

Remote-access VPNs: These let individual users such as road warriors and telecommuters connect to a corporate network. In most large corporations, remote-access VPNs are based on a combination of two things: carrier services such as AT&T's Global Network, which provide the dial-up connectivity, and security software such as Nortel's Extranet Access, which provides encryption.

An important nuance: The two don't require each other, but using them in tandem expands their effectiveness. Security software enables fixed-site remote access across the Internet (for example, cable modems and DSL), and dial-up services ensure consistent access for traveling users.

Branch-office VPNs: This type connects branch offices to headquarters. Frame services and ATM typically serve the market, primarily for reasons of cost and service quality. Private IP networks can come close to the quality of a frame or ATM network, but using Internet services can make service quality dicey.

Extranet VPNs: These let companies connect with partners (suppliers, customers, joint ventures). They require a mix of IP services and layered security software.

Why does this matter? Well, especially in this economy, companies have the funny habit of deploying technology only if it helps them cut costs, improve performance or generate new revenue. Each VPN flavor serves a different purpose. So if you're making the business case for IP VPNs to your CIO, consider this:

Remote-access VPNs save money (compared with direct-dial solutions). If you're still using direct-dial, you're behind the curve: Roll out an IP VPN today. Branch-office VPNs lower costs slightly — on the order of 10% — but more importantly, may improve the performance of some key applications (see next week's column). Many leading-edge companies are beginning to explore branch-office IP VPNs, and yours may need to as well. Extranet VPNs accelerate revenue generation by improving communication with suppliers and business partners. Most companies are still fleshing out the business processes that will make this happen — stay tuned.

Johnson is senior vice president and CTO at Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.

The Edge

■ SERVICE PROVIDER DEVELOPMENTS AT THE JUNCTURE BETWEEN THE ENTERPRISE AND THE NEW PUBLIC NETWORK

Avici takes peering, DoS defense to the edge

■ BY JIM DUFFY

NORTH BILLERICA, MASS. — In an effort to broaden the application and revenue opportunities of its Internet core routers, Avici Systems last week unveiled software designed for aggregating lower-speed links and peering between service providers' networks.

The software, IPriori 4.2, now includes features specific to aggregation and peering functions closer to the network edge, such as packet accounting, filtering and quality-of-service marking capabilities. The software is intended to reduce the number of devices required in service provider points of presence for edge aggregation, which will let users better defend against denial-of-service (DoS) attacks, Avici says.

Avici's forte has been core routing, which operates in the OC-48 to OC-192 range. With IPriori 4.2, Avici is looking to make an impact in the lower-speed arena of OC-3, OC-12 and Gigabit Ethernet.

Avici also released a new eight-port Gigabit Ethernet module for its routers that's designed to take advantage of the new software. This module — along with an existing 16-port OC-3 card for Avici's routers — lets the vendor offer densities of 320 Gigabit Ethernets and 640 OC-3s per 7-foot rack.

But densities like that mean nothing without software. IPriori 4.2 runs on Avici's Terabit Switch Router (TSR) and Stackable Switch Router (SSR) platforms. Key features include NetFlow+, port mirroring and packet filtering, which are designed to let carriers perform diagnostic traffic analysis and provide protection for their networks from attacks.

NetFlow+ is a packet accounting and billing capability that ostensibly is compatible with Cisco's NetFlow packet accounting technique. This may give carriers currently deploying Cisco routers for aggregation and peering incentive to consider Avici's TSR and SSR.

"NetFlow is a key differentiator" for Avici, says Chris Nicoll, an analyst with Current Analysis. "It helps [IPriori] 4.2 make a strong statement to say, 'If it's a Cisco network, we can slip in there.'"

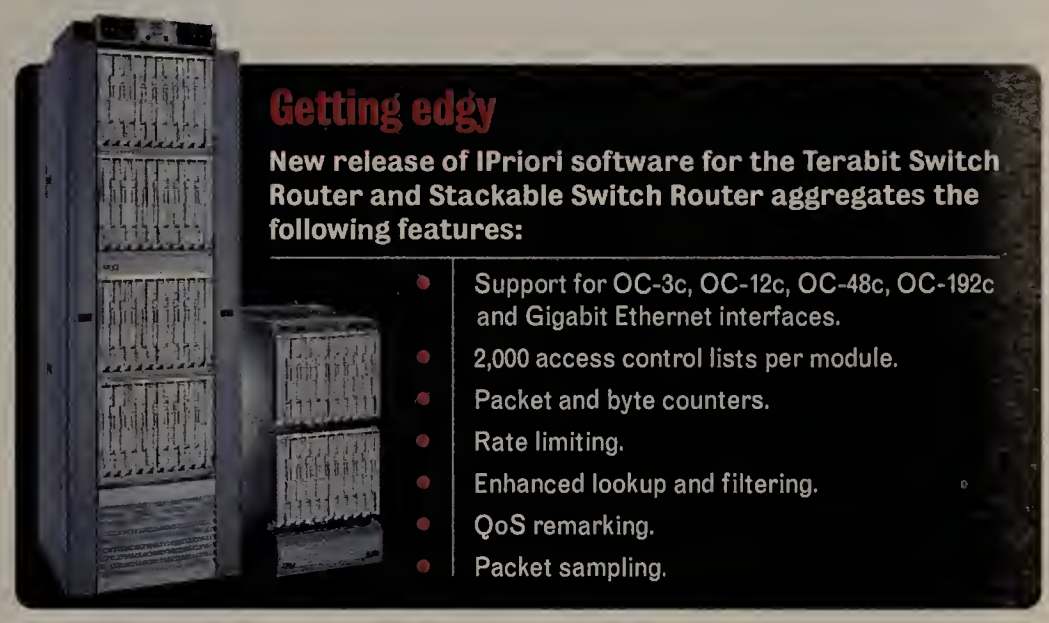
Cisco owns about 80% of the market for 1G to 9G bit/sec routers used for IP aggregation and peering, and about 73% of the market for higher-class systems, according to Dell'Oro Group. Nicoll says loosening Cisco's stranglehold on the market will be Avici's biggest challenge with IPriori 4.2.

Meanwhile, the software's port-mirroring capability copies traffic to a predefined port for inspection. The entire packet can be viewed with an analyzer to determine if a DoS attack is under way, Avici says.

Packet filtering can be enabled by IPriori 4.2's ability to establish 2,000 access control lists per module, which equates to 80,000 ACLs per TSR and 40,000 per SSR. With this capability, carriers that peer their networks can filter traffic based on source/destination addresses, TCP/User Datagram Protocol (UDP) port numbers, and protocols to determine whether packets should be forwarded, discarded or mirrored for further inspection.

IPriori 4.2 and the eight-port Gigabit Ethernet card are available now. Pricing was not disclosed.

Avici: www.avici.com



Short Takes

■ **ONI Systems** last week announced that **COLT Telecommunications, KVH Telecom** and **Telseon** are using ONI's **Online** optical transport system to sell storage-area network services to their respective corporate customers in Europe, Japan and the U.S. ONI's storage capabilities include support for Fibre Channel and Enterprise Systems Connection at distances of thousands of miles, the vendor says. Deployments to date have been for both synchronous and asynchronous data replication. www.oni.com

■ **Alcatel** recently announced that it has completed its acquisition of next-generation SONET system vendor **Astral Point.** Astral Point's offerings will let Alcatel address metropolitan-area and regional SONET requirements, Alcatel says. Astral Point's ON 5000 and ON 7000 platforms are designed to support current SONET services while enabling Ethernet and wavelength-based VPNs on the same network. www.alcatel.com

NextHop scales routing software

Company's latest release supports millions of paths.

■ BY JIM DUFFY

MOUNTAIN VIEW, CALIF. — Routing software supplier NextHop Technologies last week unveiled a new version of its product that offers greater scalability for service providers and large companies.

Version 9.3 of NextHop's GateD routing software has been enhanced to support the most common requirements of growing Internet use, such as an increasing number of interfaces, the size of the routing table and speed of convergence, the company says.

At the edge, GateD 9.3 has supported more than 64,000 interfaces in NextHop's product tests, the company says. This level of scalability is key because aggregation boxes need to collect a massive amount of PPP connections and addresses without causing a router failure, NextHop says.

Inside the carrier network, software supports hundreds of neighboring routers and greater than 500,000 Open Shortest Path First and IS-IS advertisements to and from these neighbors, NextHop says. Between carrier networks, GateD 9.3 also scales to handle 150 peers, more than 500,000 unique routes and millions of total routes, the company says.

The Internet currently supports more than 100,000 unique routes, NextHop says. Support for millions of routes is becoming a requirement, the company says, because routers at peering points not only have to carry the entire Internet routing table, they also must be able to carry a complete copy per peer.

NextHop also announced an agreement with IBM designed to let equipment manufacturers accelerate the development of network equipment. IBM and NextHop have ported GateD software to IBM's Linux-based NP4GS3 network processor for use in network equipment manufacturers' routers.

GateD 9.3 is shipping now. Pricing ranges from $75,000 to $400,000.

"Service providers have a trepidation of going with third-party router products so there's a number of places where NextHop can sell products," says Mark Bieberich, senior analyst at The Yankee Group. "But one of the questions I have is, is GateD ready for all these applications?" ■

More online!

See who's getting into the fast-growing route control market.

DocFinder: 9034

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Traffic shapers ease WAN congestion

■ BY KEVIN DAVIS

Finding a solution to network congestion requires a balance of technical, fiscal, personnel and political resources. The first step is to gain an understanding of the length and frequency of network congestion through the use of network probes and analyzers.

If the length of network congestion is short, simple queuing mechanisms and traffic prioritization of a few key network applications can reduce latency and improve application performance to acceptable levels.

If congestion is a bigger problem, more aggressive and perhaps intrusive steps must be taken. Such measures could include traffic shaping and policing, or when the congestion interval grows so large that policies are not effective, circuit upgrades.

Traffic shaping is the least aggressive of the three measures. It is a dampening function, as it seeks to delay application traffic entering the network by buffering bursts that exceed predefined rates.

Traffic shaping uses a token-bucket mechanism. A token bucket works via a system counter on the router or switch, and has three components that are related by the equation R = B/T

- R — Mean rate (the rate at which the bucket fills with tokens).
- B — Burst size (the size of the bucket).
- T — Time interval (the measurement time).

Thus, the size of the token bucket is the maximum value of the counter and is equal to the burst size. Tokens are placed in the bucket by the operating system of the router at a constant, or mean, rate, R. When the bucket becomes full (the counter reaches its maximum value), new tokens are "discarded."

When application traffic seeks admittance to the network, the queue regulator for that interface requests a certain number of tokens for each packet depending on the size of the packet. For example, the regulator will request three tokens for a 1,500-byte packet and one token for a 500-byte packet.

If there are available tokens (the counter has a value greater than or equal to the number of tokens requested), the packet is transmitted. If there are not enough tokens, the packet is queued at the interface.

The mean rate specifies that over a given period of time a certain number of bits can be transmitted by the network interface of the router into the WAN.

Because traffic shaping smoothes out application bursts by buffering excess bursts at the network edges, it can reduce network congestion to acceptable levels where simple queuing algorithms such as weighted fair queuing and priority queuing would fail — these queuing algorithms working alone propagate bursts into the network.

As with traffic shaping, traffic policing uses the token-bucket mechanism to limit application traffic to defined rates configured on the router by a network administrator.

However, instead of buffering nonconforming traffic, it works by either dropping traffic when there are not enough available tokens in the token bucket to transmit the packet, or lowering the priority of the packet before transmitting it. While this does not smooth traffic bursts, it also does not add any queue time to application traffic (though dropped packets will have to be retransmitted).

Using traffic shaping and/or policing (they can be used together) to reduce congestion within your network can significantly increase the levels of service your network provides to applications.

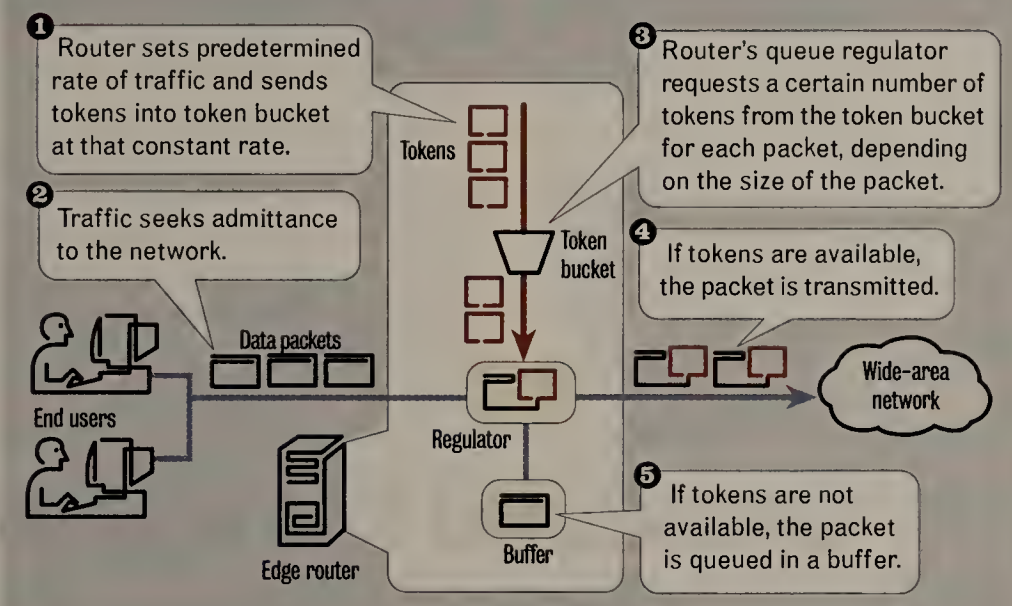
This will let you create rigorous, yet flexible, policies to efficiently avoid bottlenecks and improve end-user performance without having to go through unnecessary, expensive circuit upgrades.

Davis is a performance consultant for NetQoS. He can be reached at kevin.davis@netqos.com.

Traffic shaping

■ HOW IT WORKS

Traffic shaping uses a token bucket mechanism to limit traffic to a predetermined constant rate and send bursts of traffic that exceed the rate into a buffer.



Got great ideas

■ *Network World* is looking for great ideas for future Tech Updates. If you have one and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).

Ask Dr. Internet

By Steve Blass

We read your recent column (www.nwfusion.com, DocFinder: 9033) on Secure Shell. We're using OpenSSH 2.9 with the SSH Version 2 protocol (ssh-keygen -t rsa) on OpenBSD 2.9. Your column mentions how to use a key pair with a pass phrase. But this doesn't accomplish the stated goal of transferring files without any user interaction, because you still need to enter a pass phrase. Can you automate this without entering a pass phrase?

You may enter a blank pass phrase for ssh by pressing the Enter button when prompted for a pass phrase by ssh-keygen. When you do that, you'll get a key that requires no pass phrase. My copies of ssh-keygen all say "Enter pass phrase (empty for no pass phrase):" when it prompts for the pass phrase during key creation. As an alternative, you can protect your private keys with a pass phrase and still be able to use the keys without typing the pass phrase every time by using the ssh-agent program. Run ssh-agent, copy the output to the command line to prepare your environment variables, then run ssh-add. This adds your private keys to ssh-agent. Now you can use ssh repeatedly without re-entering your pass phrase every time.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

Running down the Web services checklist

Let's see, XML (check), SOAP (check), namespaces (check), XSD (check) . . . yep, we're well on the way to covering the basic technical territory of Web services. And you might like to check out *Network World's* Web services research page (www.nwfusion.com, DocFinder: 9038).

Actually, we're sailing away from the established core technologies of Web services and moving out into the less stable seas of technologies that are maturing and stabilizing. Here we're talking about Web Services Definition Language (WSDL) and Universal Description, Discovery and Integration (UDDI).

WSDL is a proposal that Microsoft and IBM put forward to the World Wide Web Consortium. It is a system for defining how a Web service is exposed in terms of the connection and protocols it offers. WSDL definitions are, of course, written in XML.

According to Microsoft, "a WSDL file is an XML document that describes a set of SOAP messages and how the messages are exchanged. In other words, WSDL is to SOAP what IDL is to CORBA or COM."

To put this definition another way, WSDL specifications of Web services are formal abstract descriptions of "endpoints" (ports) and messages. The issue of abstraction is important because by abstracting we can reuse definitions of components.

So what we have through WSDL are abstract definitions of messages — descriptions of data being exchanged — and definitions of ports that are abstract collections of operations. The concrete protocol and data format specifications for a set of port types constitute what are called a reusable binding — a Web service that we can access.

To define a Web service, a WSDL document uses these abstract elements:

- Types — containers for data type definitions (for example, using XSD — see "XSD gets even more interesting," www.nwfusion.com, DocFinder: 9039).
- Messages — typed definitions of message contents (data) being transferred.
- Operations — descriptions of actions supported by services.
- Port types — a set of operations supported by one or more endpoints.
- Bindings — concrete protocol and data-format specifications for particular port types.
- Ports — endpoints defining combinations of bindings and network addresses.
- Services — collections of related endpoints.

To put it simply, WSDL is a template to describe services and how they should be used by clients.

But how do you find a Web service? The currently putative answer is UDDI. UDDI is a set of protocols and public directories for the registration and real-time lookup of Web services — a sort of Yellow Pages for Web services. UDDI (again, mainly a creation of IBM and Microsoft) was officially released in May 2001, and Microsoft explains that a UDDI directory entry is "an XML file that describes a business and the services it offers" (see www.nwfusion.com, DocFinder: 9040).

As Microsoft's explains it, "There are three parts to an entry in the UDDI directory. The 'white pages' describe the company offering the service: name, address, contacts, etc. The 'yellow pages' include industrial categories based on standard taxonomies such as the North American Industry Classification System and the Standard Industrial Classification. The 'green pages' describe the interface to the service in enough detail for someone to write an application to use the Web service. The way services are defined is through a UDDI document called a Type Model or tModel. In many cases, the tModel contains a WSDL file that describes a SOAP interface to an XML Web service, but the tModel is flexible enough to describe almost any kind of service."

To put it simply, WSDL is a template to describe services and how they should be bound (that is, used) by clients.

You can find out (a lot) more about UDDI at www.uddi.org.

Next week, we wrap up Web services. Sighs of relief to gearhead@gibbs.com.

CoolTools

Quick takes on high tech toys

By Keith Shaw

Linux-based PDA is pretty Sharp

Your joy or disappointment with Sharp's Linux-based PDA will depend on whether you've ever used a PDA before.

If you are brand-new to the world of PDAs, you'll find the Zaurus SL-550 a great combination of personal productivity and fine multimedia entertainment, integrated into a sleek package. If you are graduating from a Palm or Pocket PC, you might find nothing earth-shattering with the new device.

Either way, the PDA has some first-generation kinks that need to be worked out, so it's tough to say that Sharp hit a home run with this product. Let's settle for a ground-rule double.

On the hardware side, the Zaurus is a gorgeous device — it features a pretty bright screen that can display more than 65,000 colors. The Zaurus has 64M bytes of internal memory, a 206-MHz Intel StrongARM processor, expansion slots for Compact Flash and Secure Digital cards, and an integrated keyboard that appears when you slide out the bottom part of the PDA. Peripherals that can be attached to the Zaurus include an 802.11b card for wireless LAN connectivity, a Compact Flash-based digital camera and other cards such as extra memory and Ethernet connectivity. Navigation buttons on the front of the device are easy to understand with icons for home page, e-mail, contacts and calendar as well as a four-direction button for scrolling.

It's on the software side where some of the kinks arrive, especially with synchronization. The synchronization button on the charging cradle only works after you've placed it in the cradle and have run the synchronization software from the desktop. After that, the sync button should work, but a few times we had to hold the button down longer than with a Palm or Pocket PC. Also, we discovered a bug when the synchronization software didn't recognize the change to daylight-saving time.

We also saw some odd behavior in the calendar application, and when we installed the drivers there were a few crashes. But we feel Sharp will address these problems in future software updates.

The other software applications are pretty good — we especially enjoyed the Media Player, which plays MPEG-1 video clips and MP3 audio files. The device comes bundled with the Hancom Office Suite, which includes applications for viewing and editing Word and Excel files, and for viewing PowerPoint files. Other applications included an Opera Web browser (which we didn't test because we had no Internet connections) and an image viewer. We also enjoyed a better variety of bundled games on the Zaurus than on other PDAs, although we think the computer cheats at the Scrabble-like game.

Navigating through the programs is not too difficult, similar to a Pocket PC. Multiple applications can be opened at the same time, or you can close them before starting another one. A button on the lower left part of the screen is similar to the Windows "Start" menu system.

The Sharp Zaurus SL-550 has a few kinks, but is still a good PDA.

The rechargeable lithium-ion battery gave us 1 hour and 42 minutes of battery life with constant usage (we kept repeating the same five songs on the Media Player and disabled all the power management features). However, with power management on, the battery should last much longer.

At the time of testing, there were 52 software products available through www.myzaurus.com, which has a partnership with the Web site Handango. That number pales in comparison with software available for Palm and Pocket PC devices, but you would expect that with a new device. Because the device runs on open-source Linux and also can run Java applications, it shouldn't take too long before developers make applications for the Zaurus.

If Sharp can address some of the software bugs on the synchronization side, the Zaurus is a fine first entrant into the PDA market.

Shaw can be reached at kshaw@nww.com.

Face-off

Should vendors be liable for their software's security flaws?

Two industry leaders debate whether vendors should be accountable for vulnerable products.

YES by Bruce Schneier

Network security is not a technological problem; it's a business problem. The only way to address it is to focus on business motivations. To improve the security of their products, companies — both vendors and users — must care; for companies to care, the problem must affect stock price. The way to make this happen is to start enforcing liabilities.

The only way to get many companies to spend significant resources to ensure the security of their customers' data is to hold them liable for misuse of this data. Similarly, the only way to get software vendors to reduce features, lengthen development cycles and invest in secure software development processes is to hold them liable for security vulnerabilities in their products.

Legislatures could impose liability on the computer industry by forcing software manufacturers to be subject to the same product liability laws that affect other industries. Then, if they produce defective products, they will be liable for damages. Even without this, courts could impose liability-like penalties on software manufacturers. This is happening in related cases. Judges have issued restraining orders against companies with insecure networks that are used as conduits for attacks against others. Companies that have used customer data in violation of their privacy promises or collected data using misrepresentation or fraud also have been penalized. A U.S. judge forced the Department of the Interior to take its network off-line because it couldn't guarantee the safety of American Indian data.

How ever it happens, liability changes everything. Today, software vendors can add product features and complexity without thinking twice. Liability would force them to consider whether such additions are really necessary.

Once liabilities are established, the insurance industry will step in. Companies will have no choice but to buy network insurance, just as they buy theft or fire insurance today. Liabilities are variable-cost risks. The insurance industry is in the business of turning those risks into fixed expenses. Insurance companies are going to move into cyberinsurance in a big way. And when they do, they're going to drive the computer security industry, just like they drive the security industry in the brick-and-mortar world. Insurance companies will need mechanisms to reduce risk and will quickly start charging different premiums for different levels of security.

Internet security benefits everyone. In our society we protect our environment, healthy working conditions, safe food and drug practices, and sound accounting practices by legislating and making companies liable for taking undue advantage of them. This kind of thinking is what gives us bridges that don't collapse, clean air and water, and sanitary restaurants. We don't live in a "buyer beware" society; we hold companies liable for taking advantage of buyers.

There's no reason to treat software any differently from other products. When Firestone produced a tire with a systemic flaw, the company was held liable for the resulting damages. Meanwhile, Microsoft can produce an operating system with multiple systemic flaws and not be liable. This makes no sense, and it's the reason security is so bad today.

Schneier is CTO of Counterpane Internet Security, a security monitoring company in Cupertino, Calif. He can be reached at schneier@counterpane.com.

NO by Harris Miller

The prospect of software vendor liability is gaining momentum in some government and legal circles. Some government and private sector CIOs have suggested imposing sanctions on vendors whose software is breached by viruses or other forms of intrusion, or increasing the exposure of software and system vendors to liability for such breaches. But doing so will jeopardize innovation, U.S. competitive advantage and benefits to consumers.

The potential costs of such highly subjective, generally frivolous lawsuits are dramatic. Civil liability actions against technology makers would:

- **Oversimplify the situation.** Software is not and never can be infallible. It is a product of engineering, and like other products of engineering — automobiles, airplanes, buildings, bridges — the results are not perfect. No product can be 100% secure or operate flawlessly under every conceivable circumstance. As technology's benefits increase, so do the ways users find to misapply, misuse or modify it. In the security realm, vendors are sometimes left playing catch-up as an ever-expanding number of wrongdoers find malicious uses for products. Software development is a complex process conducted in a rapidly changing business and technical environment. Furthermore, the performance of a sophisticated information system involves multiple facets, products and factors. Focusing on civil liability for alleged software flaws diverts time, attention and resources from solving customer problems.
- **Stifle innovation.** Vendors are always working to create better and more secure products, and allowing this development is best for consumers. Free market competition dictates this. Market forces are at work so software companies, service providers and technology users compete on the basis of security and functionality. The best producers of high-quality, secure software garner the most customers and succeed in this competitive environment. To introduce additional risk into this atmosphere will curb or even halt the development of newer and more secure products.
- **Compromise global leadership.** Civil liability lawsuits will not only chill innovation but also the U.S. competitive advantage in the $200 billion global software industry. The U.S. plaintiff's bar and system is unparalleled, and actions by the bar that could hinder product development would result in lost technical jobs and productivity, jeopardizing our industry's leading position in global markets.
- **Punish the wrong people.** Perhaps the most troublesome result of pursuing civil liability for vulnerabilities is the shift away from wrongdoers. The legal community would better serve its clients and citizens by supporting enhanced prosecution of computer crimes, stiffer penalties for hackers and increased cybercrime training for law enforcement.

We cannot legislate quality, productivity or innovation. The marketplace sets those expectations. Having said that, computer use — and computer crime — will continue to increase this year. Lawsuits aimed at software vendors for creating products vulnerable to attack is the technical equivalent of charging safe makers with negligence because bank robbers crack safes. Let's focus our legal system on the real bad guys.

Miller is president of the Information Technology Association of America, a trade organization representing the U.S. IT industry. He can be reached at hmiller@itaa.org.

More online!

Log on to Network World Fusion to voice your opinion on this topic. Face-off authors Bruce Schneier and Harris Miller will add their thoughts to the discussion.

DocFinder: 9028

EDITORIAL

Christine Burns

ILabs testing sets stage for N+I 2002

I've spent the better part of the past two weeks hanging out in a warehouse in Belmont, Calif., with 90 engineers, $23 million in network gear, 48,000 volt amps of power (which was not enough, by the way), more than 450 active patch cables, 1,400 cans of Coke, 860 candy bars, 20 half-pound bags of beef jerky and a dozen Asian pears.

True, we are not talking about fine dining here, but we are certainly talking about some serious network testing.

I attended the hot stage event that literally sets the stage for InteropNet Labs (iLabs), the experimental subnet of the NetWorld+Interop 2002 Las Vegas network infrastructure. Each year, the iLabs team — made up mainly of network professionals who volunteer their time for this cause — pinpoints three up-and-coming network technology focus areas and sets out to test whether the reality lives up to the hype. The designated team leads scour the market for products whose vendors claim they support the targeted technology areas, and all are invited to participate in the testing process. The iLabs team prides itself on the fact that any and all marketing baggage is checked at the door of the warehouse. The end result is an honest assessment of how useful these technologies will or won't be in your network.

The technologies to be featured at next month's show are: wireless LAN security based on the 802.1X standard; storage-area networks based on the iSCSI draft specification; and Multi-protocol Label Switching interoperability for point-to-multipoint Layer 2 VPNs. In all, the iLabs team hammered on more than 200 products in varying degrees of development from 83 vendors.

Network World recently signed on as the media sponsor of the iLabs and therefore has exclusive access to the iLabs hot stage testing ground. We've taken advantage of this access by placing members of our own Global Test Alliance on the iLabs engineering teams. Our experts will present their findings in a special package of stories in the May 6 issue of *Network World*.

And if you're attending the show, don't miss the iLabs booth (No. 6027, located in the Central Hall), where you can get a hands-on demonstration of the tests and tap the engineers who conducted them. I can't promise you any beef jerky (or an Asian pear, for that matter), but I can guarantee that you'll get something more valuable — honest data about these three network technologies.

— Christine Burns
Test Alliance director
cburns@nww.com

opinions!

Great IPX-pectations

Regarding Kevin Tolly's column "What are your IPX-pectations?" (www.nwfusion.com, DocFinder: 9030): My organization uses Macintoshes running System 9.0 for our graphic arts lab. We have been using an IPX client from Prosoft Engineering to connect to our NetWare 5.0 servers. To upgrade to Gigabit Ethernet, we would like to work in phases — the network infrastructure first, then the servers, then the clients. To do this, we would need network hardware that could support IPX and multiple port speeds (100/1000Base-T) until we upgrade our Macs to OS X and 1000Base-T in the final part of the project.

More than once I've heard a network engineer say IPX should be replaced by IP at our site as soon as possible. But IPX is working, and I don't need to replace it. I enjoy using some of the old tools, like rconsole. It would be sad to lose tools that I like just because some engineer didn't want to include IPX compatibility in high-speed switches.

Larry Steinke
Technology director
Saint Francis High School
Mountain View, Calif.

The most compelling reason for IPX services on the LAN is that you are adding an extra layer of protection and security. We all must contend with a high level of threats and vulnerabilities for all our Internet services and applications. Why not make it a little more difficult for the attackers by running internal applications and services on a protocol that can be easily blocked and controlled at the edge?

Kevin Casey
Director of technical services
Allied Global Solutions
San Marcos, Texas

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

License to kill?

Regarding "Licensing flap" (www.nwfusion.com, DocFinder: 9031): Microsoft and other vendors price products too high to begin with. I understand there are copyrights, and the licenses are to give permission to use them. Unfortunately, Microsoft and companies like it feel that the user owes them something every time he uses their products, which is why I feel at times I would like to scrap all of my Microsoft products and go for a Linux system.

It would be really ironic if a Unix-based program like Linux took over Microsoft's market share because of antitrust laws. After all, that's how the open-source Unix got its start — from an antitrust suit stating AT&T and Bell Labs couldn't sell their software.

Keith Daugherty
Fort Wayne, Ind.

The situation outlined in "Licensing flap" is why, as a network integrator, my company is learning BSD and Linux. Open-source-based platforms and software will be in high demand as companies refuse to pay excess amounts for bells and whistles.

Jason Cohenour
Owner
Automated Technologies
Monroe, La.

IBM wanted my company to purchase Client Access/400 for our PCs to connect to our IBM iSeries Model 820. For our 120 users, they wanted to hit us up for more than $28,000. I found a product from Mochasoft in Denmark that performs the same function equally well or better. Cost: $250 for an enterprise license. Another $250 and I covered every printer in the house. For us, it was a no-brainer.

Matthew Booher
Director of IT
ODC Integrated Logistics
Sparks, Nev.

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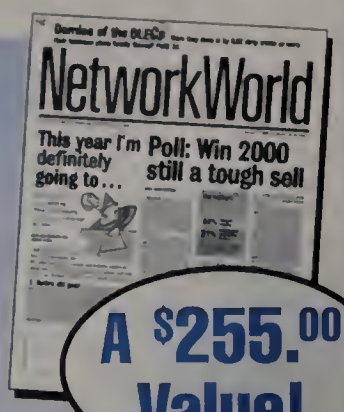

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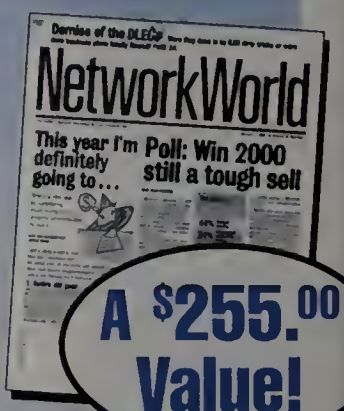

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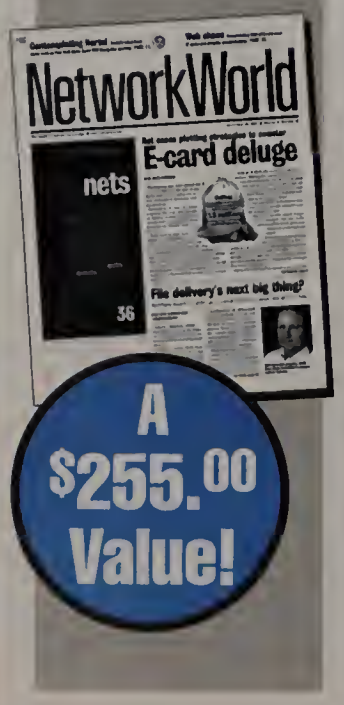

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ON THE ROAD

Sandra Gittlen

For storage, continuity is king

Time and again, we hear the term 'ensuring business continuity,' but there's no end to what that encompasses.

Next month, *Network World* launches its Storage Town Meeting. Again, Steve Duplessie, founder of Enterprise Storage Group, and I will hit the road to talk to people across the country about their storage plans. The emphasis will be on ensuring business continuity.

NetworkWorld On the road with SEMINARS&EVENTS

This topic is a far cry from the one we had planned for our tour late last year: "Building a Superior Infrastructure." We were going to talk about how you could build out your systems with massive architectures, add in all these bells and whistles and store more data than you'd ever have. Then the World Trade Center and Pentagon were attacked, and all that changed.

In city after city — we were on the road three weeks after Sept. 11 — we talked to shell-shocked IT managers not about building these high-end storage monoliths, but about disaster recovery and what they could do to safeguard their companies' intellectual property, including customer data and corporate records, in the event of a disaster.

This year we've adopted the theme that we think best suits the needs of IT executives today. Time and again, we hear the term "ensuring business continuity," but there's no end to what that encompasses. For the purposes of this tour, it simply means making sure that you know everything your company needs to get back up and running, and that you have a tested plan for making that happen. It also means that, depending on your business needs, even if for some reason you aren't around, your business could be back online in an hour, a day, a week or a month. You need to know your requirements, and you need to know how you and those around you can fulfill them.

Joining us on the tour will be presenters from Cisco, Hewlett-Packard, Network Appliance and StorageNetworks. They will address the breadth of subjects now involved in storing and accessing your data, from what plumbing you should choose to whether you want to house everything on-site or off-site.

They'll also address the need for service-centric management, how fiber optics will come into play and the status of storage-area networks vs. network-attached storage.

Duplessie will explain the emerging technologies and standards you'll deal with over the coming months. He'll also tell you what a critical role storage resource management will play in optimizing your net.

If you have topics you'd like to see covered that haven't been mentioned here, let me know. To register for this event, which kicks off on May 14, go to www.nwfusion.com, DocFinder: 9032.

Gittlen is Network World's *events editor. She can be reached at sgittlen@nww.com.*

TELECOM CATALYST

Daniel Briere and Russ McGuire

Gig-E, G-PON, Gee-Whiz

The bottom line is that fiber is heading your way.

The snappy marketers that drove the DSL industry to use 23 of the 26 letters of the alphabet to describe their technologies have moved to the optical access side of the house. We've now got A-PON (ATM passive optical network), E-PON (Ethernet PON) and G-PON (Gigabit PON).

Quantum Bridge's Charlie Guyer recently said, "When we started the company, there was no A-PON or E-PON, there was just PON. Now people are trying to divide it up and paint one as more beneficial than the other." That can get out of hand quickly, if history shows anything.

Those who watch for exciting new technologies understand the need to differentiate products. These signs of differentiation mean PON is having an impact on the market. Technology costs have come down to a point where deploying PON to small businesses and residences is starting to make sense. We're on the way, but we're not there yet.

PON provides interesting alternatives for delivering multiple services to businesses inexpensively. From an enterprise point of view, it doesn't matter what the specific underlying technology is, except as it affects the delivery of services.

Carriers using PON can't offer just data services if they're going to the trouble of upgrading old links to optical networks; they need to handle voice and video, too. That means supporting time-division multiplexing as well as IP — ATM, frame relay, private lines, audio links, the works. Customers want selectable services unconstrained by access type. Optical can and must fulfill that desire.

In the past, efforts to deploy optical technology in the local loop were hampered by insufficient bandwidth and limited to a single service. Not anymore. The latest products from vendors such as Alcatel, Quantum Bridge and others use PON technology to deliver multiple services and provide enough bandwidth to handle future services.

Scalability will be an issue with the early versions of PON, especially if the world keeps moving toward Gigabit Ethernet in the LAN, metropolitan-area network and WAN, streaming video, multimedia conferencing and so on. Even a small business will quickly need more bandwidth to keep up.

The E-PON crowd claims to offer the potential for lower costs, greater scalability beyond A-PON's 622M bit/sec and compatibility with the rest of the Ethernet world. But the group that helped develop the A-PON standard (G.983 from the ITU-T), the Full Service Access Network coalition, is working on a G-PON standard that will increase the bandwidth specified from 622M to 1.2G bit/sec.

Look for companies such as Salira Optical Network Systems and Flex-Light Networks to come out with equipment in advance of these standards that potentially attains even higher bandwidths. Others will be there when standards solidify.

It's important to note the line rate has little to do with the underlying protocol and everything to do with the state of the (optical) art and the politics around the standards body. Until standards are set, you will likely see interesting innovations to increase capacity and improve operating efficiencies. To boost the capacity of single-fiber PON strands to as high as 10G bit/sec, some vendors have added dense wavelength division multiplexing and/or coarse wavelength division multiplexing to their PON gear. This lets carriers provide service at much lower costs. Companies might begin putting low-cost optical transponders on their premises to break out wavelengths from PON. So technology previously used only in long-haul networks is finding its way into small businesses and even homes.

The bottom line is that fiber is heading your way. As PON technology continues to mature and adds bandwidth and other capabilities, the economics for carriers — and therefore their customers — gets better, and deployment increases. But like everywhere else in the network, the movement toward Ethernet in the local loop is driving a lot of innovation and putting pressure on the ATM camps to innovate. That's great, because it's going to make more optical access available to more people, sooner.

Briere is CEO and McGuire is chief strategy officer of TeleChoice, a market strategy consultancy for the telecommunications industry. They can be reached at telecomcatalyst@telechoice.com.

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NetworkWorld Review

Back-up alternatives for laptops

Picking the best product depends on how much control you want over the process

■ BY PAUL FERRILL

Protecting data stored on corporate computers is standard operating procedure. But the proliferation of laptops has added a new wrinkle to this network task. Important data is being kept on laptops, and it needs to be backed up with some regularity. In our review of enterprise laptop back-up software packages, we found that four vendors are making progress in automating this arduous task for network professionals and end users alike.

We looked at Computer Associates' BrightStor Mobile Backup, NovaStor's NovaNet Web, Novell's iFolder and Storactive's LiveBackup. NovaStor also offers its product as an online service called NovaStor Online Backup, which we also used (See story, "Backup: In-house or outsource?" page 56). We tested a Hewlett-Packard CD-RW drive on our test laptop using software from Roxio (See story, "Taking your data for a CD-RW drive," page 56).

In the end, if the ability to do a total system restore is essential, we recommend Storactive's LiveBackup. But if you only envision doing selected file restores and price is a big factor, go with Novell's iFolder.

By definition, a laptop user is assumed to be mobile because at any time the user can close the laptop up and take it somewhere else. Laptop back-up products function in much the same way that desktop back-up products do with a few added features such as the ability to save incremental file changes to a separate area on disk when disconnected from the network. These changes are transmitted to the server when the laptop is reconnected to the local network or over a remote connection.

A reasonable laptop back-up product covers single and/or multiple file restore and total system recovery tasks. While nearly all the major laptop manufacturers provide a recovery CD that will restore the machine to its factory condition, that process leaves users without their favorite applications or critical data installed. The best solution is to let the back-up product create a disaster-recovery CD that has the operating system and all necessary applications loaded, so restoring the laptop to its precrash condition is a simple, one-step operation. NovaNet Web and LiveBackup provide the ability to create a "bare-metal" bootable recovery CD that does just that. The LiveBackup process was smoother. LiveBackup builds one image that can then be written to a CD-ROM. NovaNet Web builds a directory tree on the server that is identical to the disk that the user is trying to restore and requires the user write those files to a CD-ROM.

At the file level, there are several ways to approach the back-up problem. First, periodic snapshots of files can be taken on the client and saved to the server. BrightStor Mobile Backup and NovaNet Web do this. Second, you can track when files are opened and closed, and save a copy each time. LiveBackup uses this method. A slight variation on the theme is to synchronize files between the client and server. iFolder uses this technique coupled with a Web-based access method to retrieve files should a client not be installed.

All the products use some technique to determine what has changed in a file since the last time it was backed up. Storing incremental changes helps reduce overall server storage requirements. All the products use a type of local cache to store changes when disconnected from the network. Once a connection is made, the results are transmitted to the server. They also use compression techniques to reduce the overall size of the files, and the result is acceptable back-up times, even over a dial-up connection from a hotel room. The products took approximately 10 minutes to back up about 1G byte of files.

Choosing the right back-up product for your enterprise network comes down to deciding how much control you want to maintain over the process.

Protecting user information with the least amount of administration appears to be the goal of every vendor in our roundup. Each product attempts to make as much of the process a "self-serve" proposition as possible. In the case of BrightStor Mobile Backup and NovaNet Web, the client schedules or initiates all back-up and restore operations.

BrightStor Mobile Backup, LiveBackup and NovaNet Web let the user expressly exclude certain files from the back-up process. Most companies won't see a need to keep copies of a user's MP3 audio files. They also don't back up discardable data.

Net Results

LiveBackup 2.5

3.13 RATING

Company: Storactive. **Price:** $99 per client for 100 nodes. **Pros:** File-versioning feature available; constantly monitors files for changes. **Cons:** Back-up set tied to physical machine; requires Microsoft SQL Server 2000. **Website:** www.storactive.com

iFolder 1.0

3.13 RATING

Company: Novell. **Price:** $49 per client for 100 clients. **Pros:** Works with any sever environment; very little administrator or user intervention required. **Cons:** File versioning not supported. **Website:** www.novell.com

BrightStor Mobile Backup 2.0

2.93 RATING

Company: Computer Associates. **Price:** $65 per client for 100 clients. **Pros:** Great support for group administration. **Cons:** No support for "bare-metal" restore; requires a default printer to be installed and either Microsoft Word or the Word viewer to see reports. **Website:** www.ca.com

NovaNet Web 8.1

2.93 RATING

Company: Novastor. **Price:** $89 per client for 100 clients. **Pros:** Simple user interface; backups are user controlled. **Cons:** No way to initiate file restoration from administrator console; no support for groups of users; scheduled or immediate backups only. **Website:** www.novastor.com

What's the score?	LiveBackup 2.5	iFolder 1.0	BrightStor Mobile Backup 2.0	NovaNet Web 8.1
Administration 30%	3	3	3.5	2.5
Ease of use 25%	3.5	4	3	3.5
Performance 25%	3	2.5	2.5	3
Documentation 10%	3	3	2.5	2.5
Installation 10%	3	3	2.5	3
TOTAL SCORE	3.13	3.13	2.93	2.93

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected **1:** Consistently subpar, or lacking features being reviewed.

Neither LiveBackup nor NovaNet Web will let users back up and restore operations from the administration console. The user has to go to the client to initiate either process. We'd prefer to have the option of forcing client machines to perform backups, even though this could cause problems for a road warrior on a modem. BrightStor Mobile Backup's console provides a way to initiate a restore from the server. It lets the user select specific files and schedule them to be restored.

LiveBackup includes a System Image Wizard to guide you through the process of creating a bootable CD for a "bare metal" recovery. To use this feature, you must enable the entire system for backup. Creating images to recover Windows XP systems is not supported in LiveBackup Version 2.5, but it will be supported in a future release. Selecting the entire system backup option could result in huge disk storage amounts, depending on how many laptops were covered. LiveBackup minimizes this problem by saving common files such as Windows system files in a shared database. This reduces the amount of time spent performing backups because any given system file will be copied to the backup server only once.

LiveBackup provides four reports that give details on client activity, data profile, space consumption and charge-back information. BrightStor Mobile Backup has similar reports but requires Microsoft Word or a Word viewer to view it without printing.

Ease of use

When judging a product with respect to ease of use, it's important to look at the topic from the user's and the administrator's perspective. On the user side, the ideal situation would be an effortless automatic system with no action required except when you need to recover a file that has been corrupted or inadvertently deleted. From the administrator's side, automation is a good thing. From backing up the data to tape to automatically tuning the database, the more these functions happen in the background, the better.

IFolder was the easiest product to use from both points of view. The synchronization program keeps the files in the iFolder directory constantly replicated between system and server. The administrator has control over how often the updates take place, so an end user need not worry. The only hitch is that iFolder is a synchronization product, so older versions of files are not maintained.

As a security measure, LiveBackup does not support file recovery from any other machine besides the one on which the files originated. While the individual user can't get at his files from a different location, an administrator can move files from one backup set to another. LiveBackup uses wizards to step the administrator through different tasks such as document migration. Using this wizard, any type of file can be moved from a source computer to one or more target computers. Other LiveBackup wizards include the System Image Wizard and the Remote Rollback Wizard, to remotely roll a computer back to a previously known good state.

The NovaNet Web client uses an interface similar to Windows Explorer, letting users choose the back-up set from which they wish to restore their files and letting them select individual files or entire directories to restore.

Storactive provides a number of features, such as its data-aging service, which makes keeping track of stored data much simpler.

LiveBackup and NovaNet Web provide a way to charge users for their storage. This would be especially appealing to service providers looking to add a back-up solution to their offerings or to companies that charge back to departments for services that MIS provides.

All the products tested provide documentation as electronic files. LiveBackup's documentation includes five separate files pertaining to LiveBackup. All the documentation for these products, with the exception of NovaNet Web, use the bookmarks feature of Adobe Acrobat to provide a clear table of contents.

Storactive was the only company that provided a "Quick Install" guide to get you up and running in short order.

LiveBackup and BrightStor Mobile Backup made it especially easy to install the client software. LiveBackup provides a Web-based distribution point so users can browse to your server from any Web browser and follow the instructions. BrightStor Mobile Backup lets you install from a CD or use e-mail to distribute the client installation files.

All these programs have special needs on the server side of which you should be aware. IFolder and LiveBackup will take over the primary Web server on your machine if you let them. They can be configured to use alternate ports but, by default, use Port 80, which is the primary HTTP port. It may surprise some to learn that the server portion of Novell's iFolder will install on Windows NT/2000 and on NetWare servers. On Windows you must have a Lightweight Directory Access Protocol-capable server installed such as Microsoft Active Directory or Novell's e-Directory for NT. LiveBackup requires the use of MS-SQL server, which adds to the cost of LiveBackup.

With the three true enterprise back-up products, BrightStor Mobile Backup, LiveBackup and NovaNet Web are relatively close in features and functionality, the bottom line could come down to price. If you foresee the need to do bare-metal restores, LiveBackup's total system restore is the easiest to use, which could reduce its total cost of ownership. At $89 per user, NovaStor has priced its Web Backup product very aggressively. But Novell's iFolder is the least expensive of the bunch. While it might not offer all the functionality of its competitors, if you're just looking for a way to keep a back-up copy of your important files and to access that backup remotely and easily, it may be the best bet.

Ferrill is a freelance writer in Lancaster, Calif. He can be reached at paul.ferrill@verizon.net.

Backup: In-house or outsource?

NovaStor's storage service works well but can be pricey.

NovaStor markets NovaNet Web as a point product and as an online service. If you purchase NovaNet Web, you install it on one of your servers and handle backups yourself. If you don't have the staff to devote to the back-up system, if you don't have the connectivity to let your road warriors connect to you, or if you don't want the hassles of a back-up system, you can let NovaStor Online Backup handle the backups for you.

The online service functions almost identically to the enterprise version with the only difference being you have no access to the administration portion of the program. We gave NovaStor's online back-up offering a workout, backing up and restoring several large files while connected by DSL.

Not too surprisingly, it worked just like the NovaNet Web product. Where NovaNet Web lets you create your own restore CDs, the NovaStor Online Backup service will ship your data to you on CDs for $25 per disk.

Some system managers have reservations about letting backups rest in someone else's hands. While all online back-up services let you encrypt your data in transit and in storage, that's not enough comfort for some managers. Another issue is the price. NovaStor charges $18 per 500M bytes of storage per month. If you have a lot of storage, this could be reason enough for you to move to an in-house system.

— Paul Ferrill

Taking your data for a CD-RW drive

Roxio offers a low-end back-up and restore option.

CD-RW drives offer the most flexibility to the end user in terms of laptop back-up processes, letting them choose how and when they complete their data back-up procedures. Most major laptop vendors offer CD-RW drives as standard equipment or as an option. In our tests, we used Roxio's (an Adaptec spin-off) Easy CD Creator 5, which includes a hard drive management and data archiving tool. We found this worked well for backing up and restoring files on a single laptop machine.

Relying on humans removes responsibility. Recurring failure to remember to perform back-ups is probably the main reason why most organizations go to some sort of automated system.

It's also a matter of time. In many cases, time spent performing those backups would be much better spent by someone in the IT department using central resources.

The lack of centralized management tools would have caused this approach to come in a distant fifth in our test had we scored the product.

— Paul Ferrill

How we did it

We used an Hewlett-Packard Omnibook 6100 laptop running Windows 2000 Professional in our test bed. The laptop included a CD-RW drive, 30G-byte hard drive, built-in 56K bit/sec modem, 10/100M bit/sec network and 802.11b wireless connections. We loaded all the server software on a Compaq ProLiant 5500 running Win 2000 Server. We used the products to back up our laptop, and then restored selected files and tried out any total system restore options. We backed up over our local 100M bit/sec network and over DSL connections. To test the online service we used a 56K modem and using the laptop's wireless capability through the DSL connection.

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NetworkWorld Review

Dantz's Retrospect Server Edition

A new twist to Windows backup

■ BY TOM HENDERSON, NETWORK WORLD GLOBAL TEST ALLIANCE

Operating system vendors in general have routinely fallen short in their efforts to bundle good back-up applications that can protect data on servers and clients across enterprise networks.

Dantz Development's Retrospect Server Edition Version 5.6 is unusual software that addresses this operating system shortfall in a unique way. It provides incremental server and workstation backup based on its own cataloging, rather than the ancient archive bit offered by other back-up programs on the market.

This methodology, we found in our testing of the latest version of the product, provides a unique back-up scheme for Windows servers and Windows and Mac clients. By taking cataloged snapshots of aggregate data, Retrospect creates its own back-up filing system that combines for speed, convenience and easy management, giving us good reason to designate it a World Class product.

Retrospect builds its catalog based on file name, creation date and last modified date attributes, as opposed to using the standard binary operating system archive semaphore used by other back-up utilities. The Retrospect server builds a user-definable back-up set and then builds backups based on iterative file deltas on target clients and servers.

Retrospect restores the iterative change sets by collecting the catalog entries specific to the target machine then restores all at once, or to a specified version. This method lets you roll machines back to desired states. Dantz calls this feature IncrementalPlus, and it gives users good management support with a minimum of administrator intervention.

Dantz also licenses clients and servers at the same price, which is quite cost-effective compared with other pricing schemes. We tested the product on a Windows 2000 Advanced Server, and a Windows 98SE PC using a variety of tape drives (see How we did it, www.nwfusion.com, DocFinder: 9026). Retrospect installs as a background process at the server.

The client software installs simply, and Retrospect can use multicast or broadcast domains, direct addressing or Windows Internet Name Service to find its clients if desired, so that missing roaming licensed Retrospect client members can be found and backups started in an unattended fashion. We also successfully used Retrospect over broadband VPNs using Point-to-Point and IP Security protocols.

Retrospect supported all of the writeable media in our lab, and Dantz maintains a painfully exact list of tape drives/autochangers, CD-RW/DVD-RAM and other devices that it supports. Backups to server media also are supported, although a back-up set cannot exceed the size of the volume of a discrete back-up media. This means that CD-RW devices, even though Retrospect compresses data, aren't very useful for modern backups, while DVD-RAM drives might be. Dantz also uses a non-Windows-compatible International Standards Organization file system for CD-writeable devices that can't be booted or read by NT File System or File allocation table-based Windows machines.

In Retrospect's favor, its ability to judge a server's removable media and back-up device state and then represent that visually is strong.

Retrospect Snapshots group files within back-up sets to picture the state of files within volumes that have been selected for backup. Snapshots keep the dependencies of the files listed in the Retrospect catalog in groups. Snapshots are easy to manipulate, and they make restoring groups of files or an entire volume simple.

Although, because of the Snapshot method, restores made through a search of the catalog don't have NTFS or Mac file-sharing privileges restored with them unless the files are restored from a Snapshot, making the restore-by-search feature less handy than we had hoped. We used the search feature during random restores, then had to manually cross-reference a Snapshot to retrieve files with access permissions intact.

Retrospect is speedy in backup and restore operations, whether iterative periodic backups or entire volume restores. We also did a bare-metal restore on 98SE and Win 2000 with success. Autochanger operations were somewhat faster than competing back-up applications because Dantz let us select back-up sets from specific tapes within the autochanger magazine, permitting comparatively direct access during backups and restores from back-up set Snapshots.

A few missed steps

There are several things missing from Retrospect Server Edition. The first is support for Linux/Unix/xBSD as clients or servers. (Macintosh is supported.)

Also missing is a Web browser interface to the server application, which would make accessibility easier for branch-office support.

The final shortcoming we found was that while its back-up sets are easy to create, they couldn't be modified after creation. While some rigidity is acceptable, it also meant that we created back-up sets that became superfluous but necessary for the restoration process. Therefore, back-up sets must be well thought out prior to execution and aren't good for experimentation value. But overall, the highly articulate convenience that Retrospect provides over competitive back-up and restore products will be welcomed by most network professionals, despite its few rough edges.

Henderson is principal researcher for ExtremeLabs of Indianapolis. He can be reached at thenderson@extremelabs.com.

Net Results

Dantz Retrospect Server Edition 5.6

4.55 RATING

Company: Dantz Development, (925)253-3000, www.dantz.com
Pros: Highly controllable back-up processes; extensive media support; strong management features; great documentation.
Cons: Lacks Linux/Unix support and search-and-restore feature.

What's the score?	Dantz Retrospect Server Edition
Management/Administration 40%	4.8
Performance 40%	4.7
Operating system compatibility 10%	3.5
Hardware support 10%	4.0
TOTAL SCORE	4.55

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Management

Strategies

- CAREER DEVELOPMENT
- PROJECT MANAGEMENT
- BUSINESS JUSTIFICATION

Negotiating hardware maintenance

Critical needs, available resources and past experience help executives justify service costs.

■ BY SUZANNE GASPAR

When Jim Olson asked his hardware maintenance provider two months ago for help upgrading a VAX system, the company told him it didn't have anybody on staff who knew that box.

Jim Olson, CIO of Waterbury Hospital, got stuck with a support bill from Compaq when his hardware maintenance provider was unable to upgrade a VAX.

Olson, CIO of Waterbury Hospital in Connecticut, says RetroFit Technologies surprised him with its lack of hands-on experience with his Digital Equipment VAX 6440 server, so he declined the company's offer to "just come in and look at it." Instead, he turned to Compaq and paid the vendor $450 for a one-shot "Time and Materials" service to upgrade the server's firmware and Open/VMS operating system.

The hospital's 10-year-old VAX was losing horsepower for the critical laboratory system running on it, so Olson decided to cluster two CPUs. This lets him squeeze two more years of life from the box while the hospital raises $900,000 to upgrade the lab application.

When Olson negotiated his one-year maintenance agreement for the VAX and a few other servers, he didn't think to ask RetroFit if it had someone who could perform a VAX upgrade. "We didn't have a statement in the contract that said if there is a lack of expertise, the vendor will expense the engagement of the manufacturer," he says.

Maintaining older hardware is challenging. To choose a maintenance program that best meets your needs, IT executives recommend that you assess your in-house IT skills and that of service providers, determine whether you'll need access to spare components and know the expected level of risk for critical hardware failure.

Hardware manufacturers, third-party maintenance providers and systems integrators offer various levels of support. If you have a talented IT staff and spare parts, a contract that stipulates service by the next business day might make sense. But if you lack on-site hardware programs, it's better to choose access to an engineer for troubleshooting through a 24-7 agreement that gets you on-site help within four hours.

You can save money by braving minimum support and increased downtime for noncritical gear. And while nobody knows hardware better than the manufacturer, you usually can get a deeper discount by using one maintenance provider to service your routers, servers, PBXs and other gear.

"Some companies save up to 50% by going with a third party for hardware maintenance," says Lawrence Orans, senior analyst with Gartner. "Satisfaction is a mixed bag. The top folks are pleased they're saving money. But the guys in the trenches aren't pleased because the service isn't always satisfactory."

Joe Moore, IT director for the Arizona Office of the Auditor General in Phoenix, has no qualms about using a third-party service provider. "I have used local partners to set up routers, switches and file servers, so when I hear that they are getting into voice over IP, I feel confident that they can maintain my equipment," he says.

However, lack of availability of spare parts can increase downtime, as Olson knows all too well. After a CPU on an IBM RS6000 running payroll went down and failed over to the backup CPU, he was stuck waiting while IBM flew the part in overnight. Human resources had to put off noncritical transactions until the faulty CPU was replaced.

Rich Glasberg, director of data communications for the commonwealth of Massachusetts in Boston, agrees that it's useful to keep spare components. However, he says some gear requires ongoing software maintenance, and maintaining a pool of spares is costly. A spare router may need a software upgrade after six months.

What's more, Glasberg says keeping a lot of spare gear hanging around could be dangerous because technology changes quickly. "You can find yourself with older technology sitting in your bunker. When it comes to upgrading to new technology, you've got technology that you can't get much money for," he says.

Knowing your component failure rate helps you estimate your availability risk and justify the cost of the storing of spares on-site vs. contracting with your vendor to store equipment at certain revision levels in its inventory, Glasberg says.

But mean time-to-failure data is hard to estimate, Olson says. Hardware maintenance vendors have reliability figures they've collected, but they don't often share these figures.

"The mean time to failure might be eight years by design," Olson says. "But I want to know, 'What has your experience been with these parts failing?'" He plans to ask that question in his next contract negotiation. ■

negotiation know-how

Network executives share these tips for nailing down a hardware maintenance agreement:

- Review resumes and ask about staff turnover.
- Negotiate based on contract length and volume, and for keeping parts close at hand.
- Check references.
- Pit one vendor against the other.
- Have your lawyer add in protection clauses and wiggle room.
- Pay up front and propose terms such as offering free office space or serving as a reference to nail a deeper discount.

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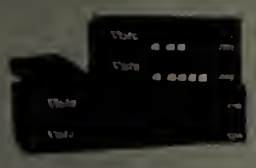

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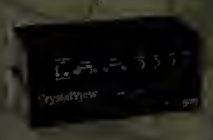

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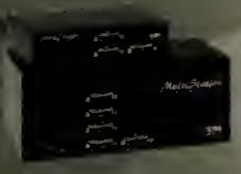

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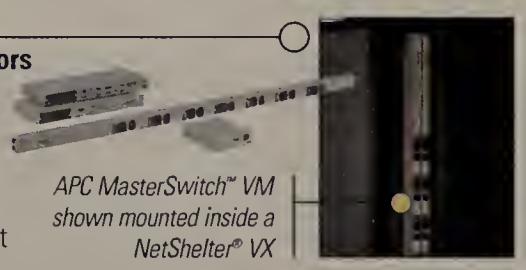

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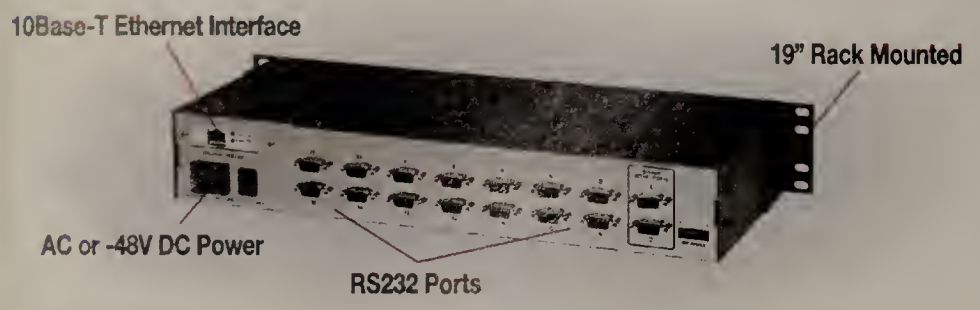

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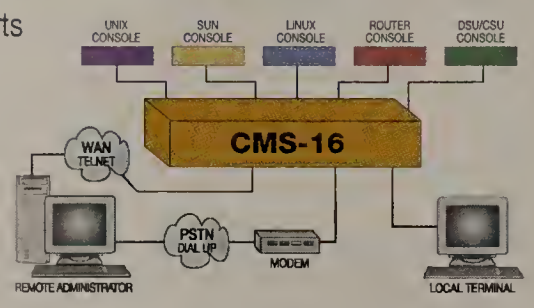

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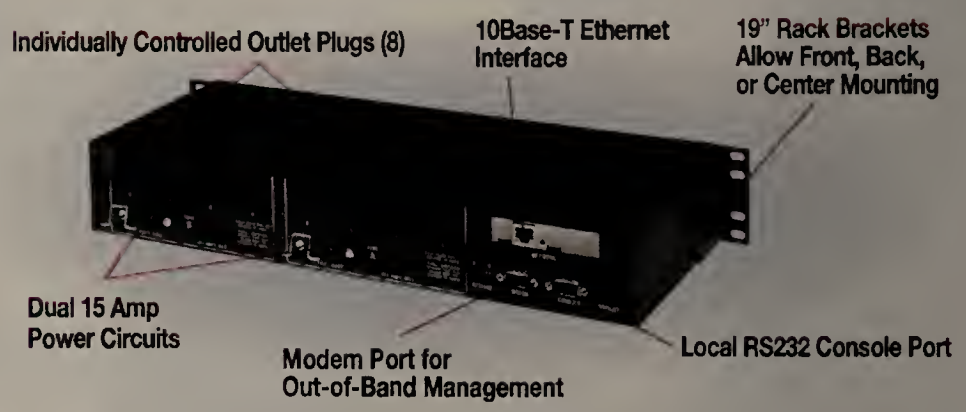

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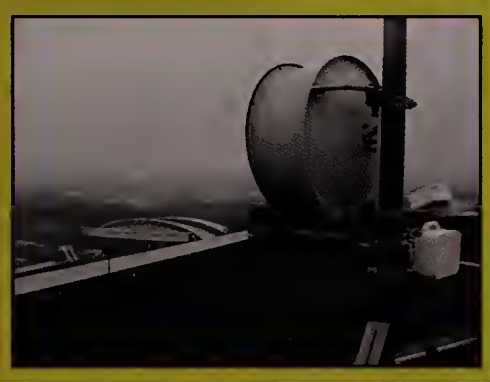

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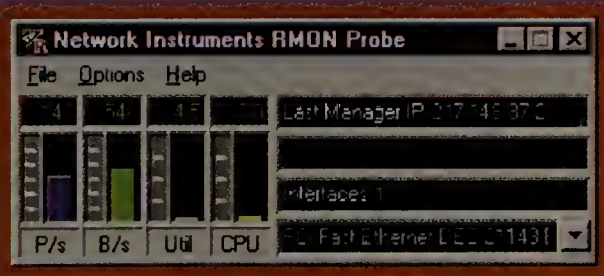

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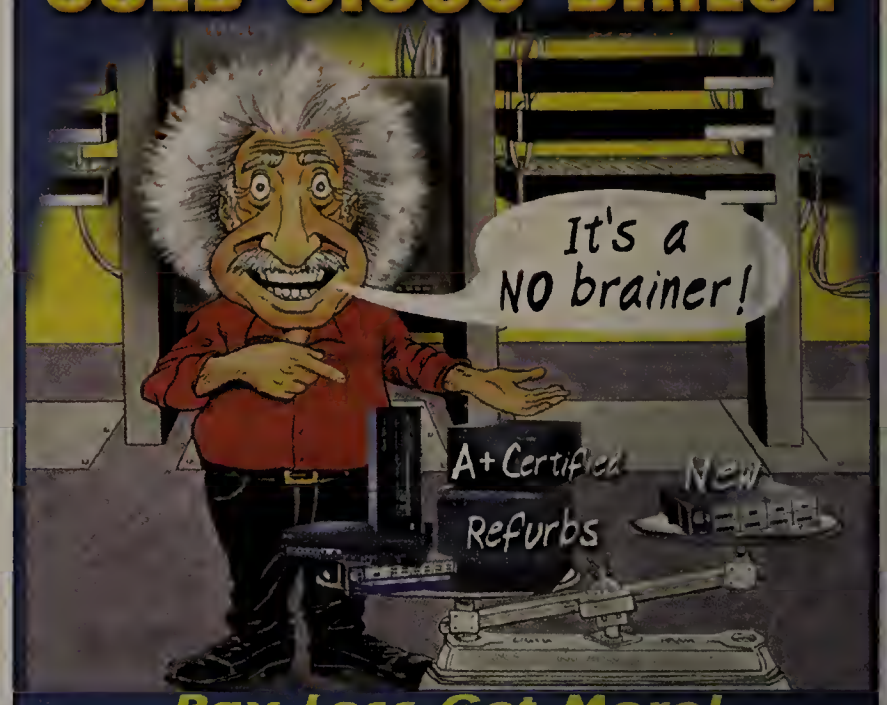

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Plan, analyze, dsgn, dvlp & test s/ware using Oracle, Lotus Notes, Web; use GUI & object-oriented dsgn to dvlp user interfaces & data entry screens that support business functions. Bach in Info Sys or Comp Sci or Business Admin. CODE: ZPA
Staff Programmer/Analysts
Evaluating applications development projects, leading a team of Programmer analysts/interns; planning, analyzing, dsgng, dvlpng & testing s/ware using Oracle & Lotus Notes; using GUI & object-oriented dsgn to dvlp user interfaces & data entry screens. Bach. needed and 2 years as Programmer/Analyst. CODE: SPA
Fax resumes to: Raja Faris, National Instruments Corp at 512-683-6924. Job Code must appear on resume.

Programmer Analysts/Network Engineers/Software Engineers (all multiple positions) sought by computer s/w consultancy firm in Yardley, PA. Must have Bach in Comp Sci., Engg or equiv and one yr relevant exp. Respond to: HR Dept., Global Systems Technologies, Inc., 109 Floral Vale Blvd., Yardley, PA 19067.

Computer/Info Systems
Coral Technology Corporation, a Software Design and Consulting firm seeks to fill the following position in Streamwood, Illinois, and unanticipated locations in the US;
Programmer Analyst, Must have BS & 2 yrs software development experience.
Respond by resume to Coral Technology Corp., Michael Deluca, 37 W. Briarwood Drive, Streamwood, IL 60107.

QA Analyst, wanted by IT company in Ohio. Must have Bachelors Degree in Engineering or Science besides two years of experience in analyzing and performing software quality assurance of applications using SOA Suite, Winner, Load Runner, Test Director and Silk Tools for Unix, Sun-Solaris, and Windows 95/98/2000/NT environment; analyze user requirements and implement test procedures; writing test Scripts and performing OA with different test cases; User Interface, Regression, Back-end, Database testing and Documenting Errors; Communicate and create periodical status reports; Perform queries to check the Database; performed OA for compatibility of various browsers.
Respond to Anthem Technologies, Inc., 77 West Elm Wood Drive, Suite 113,Dayton, OH 45459.

Computer Professionals w/exp to install, program, analyze, design, develop & test scripting, data conversion, end-to-end testing, testplan, testing Life Cycle & Bug Life Cycle in automated test environment of web & client server applications using WinRunner, Automation tool, performance testing using LoadRunner, Test Director, SOL Server & Oracle. Send resume to: Recruiter GITS, LLC, 7067 East Chestnut Hill St, Littleton, CO 80130. Email: recruiter@globalinfotechservices.net No in-person resumes/interviews, only respond by mail or email.

divine,inc. computer software applications developers and consultants, are seeking qualified applicants for the following positions: Systems Engineer, Senior Application Integration Engineer, Staff Software Engineer, Senior Software Engineer, Senior Engineer, Software Engineer, Engineer, Sr. Technical Training Specialist, Sr. Consultant, Consultant, Director of Development and Integrations, Development Director, Loader/Development Team Lead, UNIX System Administrator, Gateway Developer and Director. Openings are available at the following locations: Fairfield, CT., St. Louis, MO, Burlington, MA, Chicago, IL., Denver, CO., Norcross, GA, Columbus, OH., and Santa Monica, CA. Interested applicants should forward their resumes: divine,inc., Attn: DK 1;3333 Warrenville Rd., Lisle, IL. 60532 or by fax addressed to DK 1 at: 630-799-0060. EOE

SYSTEMS ANALYST: Responsible for systems development & production support. Work experience in the following Information Technologies: Mainframe Based Applications, Altamira Banking Software, CICS, MVS, TSO, ISPF, DB2, PACE, COBOL, RPG400, SAFE, JCL, VSAM organization, analysis, design & structured programming methodology. All modules of Abanks front desk System and SIMM Information Banking system. Experience redesigning & programming General Ledger applications from Mainframe to AS/400 using Cobol400 and RPG400. Ability to work on all phases of application development from gathering & analyzing user requests up to deploy in production.Min. 4 yrs exp. in job offered. Competitive salary, F/T, Mon-Fri (may require evening & weekends), must be willing to travel & relocated as necessary, position available in Ft. Lauderdale, FL. Monica de los Riosat Softtek: 2900 University Drive, Coral Springs, FL 33065

Sagarsoft, Inc is seeking individuals to work at various locations throughout the U.S. Seeking: Software Engineers, Programmer Analyst, Quality Assurance Engineers, DBA's and Systems Administrator. Reqs: B.S. plus experience. Senior Software Engineers, Senior Programmer Analyst. Req: M.S. plus experience or B.S. plus 5 years experience. We are seeking applicants with the following skills: Sybase, Oracle, C++, VC++, Pro *C, FoxPro, SAS, business objects among others. Apply to: Sagarsoft, Inc. 78 Eastern Blvd., Glastonbury, CT 06033

Ld. Programmer/Analyst wanted by recruitment org. in Melville, NY. Reqd B.E. or equiv + 3 yrs exp incl. Oracle, SOL, PowerBuilder. Fax resume to M. Storelli at (631) 844-7426.

Senior Software Engineer wanted in Houston, TX. Research, design and writes computer software, applying techniques of software engineering and mathematical analysis. Designs Data Models, Process Models, and Object Models. Designs database applications using Powerbuilder, Oracle, and Sybase. Requires a Masters degree in Computer Science or Computer Engineering and 3 years progressive experience. Send resumes to: HR Dept., Codon Group Inc., 9894 Bissonnet, Ste. 445, Houston, TX 77036.

Dublin Manufacturing Co. seeking F/T expd. Manager of Product Support to research, design, and developing of computer software systems, in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost constraints. Consult with hardware engineers and other engineering staff to evaluate interface between hardware and software, and operational and performance requirements of overall system. Formulate and design software system, using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Bachelor's degree in Computer Science, competitive salary. Fax resume to Alison (561) 995-6027.

SOFTWARE ENGINEER to provide on site consulting to perform object oriented design for client/server and internet industrial software applications using C/C++, J2EE, JavaScript, VBScript, HTML, Java, XML, XSL, WebLogic, Oracle, Roguewave, CORBA in UNIX/Windows and Rational Rose/Together J and web reports. Require: M.S. in Electronics Engineering/Computer Science and two years experience in the job offered or any experience providing skills in described duties. 40%travel required to client sites within the United States. Salary: $72,000 per year, 8 am to 5 pm, M-F. Apply with resume to: President, ObjectNet Technologies, Inc., 1117 Perimeter Center West, Suite N402, Atlanta, GA 30338.

Softline Systems is seeking qualified Programmer Analysts, Systems Analysts, DBAs, and Software Engineers for various positions to work at client sites throughout the US. Applicants must have a B.S. in Computer Science and 1 yr relevant experience. Send resume to: Softline System, Attn: Human Resources, 690 Canton St, Suite 290, Westwood, MA 02090.

Technical Support Specialist. 8a-5p. 40 hrs/wk. Analyze project; assign & coord work schedules; review, test prgm for compatibility; troubleshoot & provide tech support/updates using Oracle, VB, JavaScript, XML, Perl, Shell, HTML, C,C++, UNIX & Win NT. Reqmt: Bach or equiv in Comp Sci/Engg; Electrical, Electronics or related Engg; Info Technology, Commerce or Bus Admin/Mgmt. 2 yr exp in job offd or as Project Dvlpmt Coordinator or Resource Mgr. Resume to: Concept Software & Services, Inc., 7094 Peachtree Indus Blvd, #201, Norcross, GA 30071.

PROGRAMMER sought by e-commerce provider in Houston, TX. Respond by resume to: D/S, Y/H, Director of Technology, ChanneLinx, Inc., 3910 Kirby Dr., Suite 201, Houston, TX 77098.

DIRECTOR OF TECHNOLOGY-Interior Construction Company seeks Director of Technology with the following responsibilities: Oversee a network of 100 workstations, 15 servers & a tech. staff of 2 programmer analysts & 5 network technicians; design & build construction information system & integrate w/existing legacy accounting system; integrate existing construction technology with AIA standard processes to streamline the work processes. Successful candidate will have a Bachelor's degree in Computer Science or Civil Engineering, & 1 y exp. in job duties or 1 yr. exp. as Civil Engineer. Experience in DB programming, Drywall technologies & processes & NT networks a must. Mail resume to Component Assembly Systems, 620 Fifth Ave., Pelham, NY 10803, Attn: John Rapaport.

Computer Programmer, Bklyn, NY - Develop & write programs to store, locate & retrieve documents, data & Information for retail & wholesale clothing company. Plan layout of new & modify existing system, using standard programming languages (dBase, COBOL & Turbo C),network systems (LAN/WAN) & routers (Cisco). Bachelor's w/computer specialization or equivalent.2yrs of related computer exp req'd. Send CV: 4609 1st Av, Bklyn, NY 11232, att: Albert Nigri. Fax 718-369-7410.

ASSOCIATE APPLICATIONS DEVELOPER - 40 Hours Per Week, 9:00 a.m. - 5:00 p.m., $39,420 per year, Located in Miami Floirda. Requires Bachelor's Degree in Management Information Systems-As part of the project team environment will support development and implementation activity for medium to complex Client Server applications. Will use and adhere to a Software Development Life Cycle process. Must have a strong working knowledge of one or more of the following: WINDOWS API, Visual Basic, Familiarity with SOL. Send resume to Attn: CWBC at Beckman Coulter Inc., via e-mail at ehr.staffing@coulter.com

Actuarial Programmer with pension applications experience for Senior Consultant position in Teaneck, N.J. E-mail resumes to: resumes-JXP@buckconsultants.com.

Senior Mechanical CAD Integration Software Development Engineer to design, program, document and test interfaces for third party mechanical Computer Aided Design ("CAD") engineering design systems including Pro/Engineer, Solidworks, and AutoCAD on Unix and Windows NT operating systems. Analyze existing legacy database management and file processing systems for electronic mechanical CAD engineering document storage and control, and provide design and feasibility analysis for enhancing and upgrading systems utilizing C++ programming language and other software development tools. Analyze and propose changes to mechanical CAD software integrations to improve overall system reliability and throughput. Review software developed to ensure compliance with functional and technical specifications. Create and maintain unit level automation regression test systems for software code developed. Develop and implement software test plans, prepare test standards and procedures for performing mechanical and automated test programs. Perform analysis and document test results for mechanical CAD integrations and other general integration tools. Provide technical guidance and support on mechanical CAD design engineering to software developers and quality assurance engineers. Requirements: Master Degree in Mechanical Engineering and one (1) year experience in job offered or one (1) year experience in mechanical engineering research and development. Candidate must also possess demonstrated expertise designing mechanical systems using Pro/Engineer, Solidworks, and AutoCAD; demonstrated expertise utilizing mechanical design systems running on Unix and Windows NT operating systems; and, demonstrated expertise utilizing mechanical design systems to write software interfaces using C++ programming language (experience gained during graduate studies acceptable). 40+ hours/week, 8:00AM to 5:00PM, $85,000/year. Submit two (2) copies of resume to Case #20012162, Labor Exchange Office, 19 Staniford Street, 1st floor, Boston, MA 02114. Must have proof of legal authority to work permanently in the U.S.

Senior Mechanical CAD Integration Quality Assurance Engineer to perform tests for integrations of third party mechanical CAD engineering systems including Pro/Engineer, Solidworks, and AutoCAD on Unix and Windows NT operating systems. Analyze related documentation, software designs, and software code. Analyze existing legacy database management and file processing systems developed using C++ for electronic mechanical CAD engineering document storage and control, and provide recommendations for improvement particularly those to support mechanical CAD integrations. Develop and implement software test plans, prepare test standards and procedures for performing mechanical and automated test programs, and perform analysis and document test results for mechanical CAD integrations and other general integration tools. Analyze and propose modifications to mechanical CAD software integrations to improve overall system reliability and throughput. Review software developed to ensure compliance with functional and technical specifications. Create and maintain unit level automation regression test systems for software code developed. Provide technical support and guidance on mechanical CAD design engineering to software developers and quality assurance engineers. Requirements: Master Degree in Mechanical Engineering and two (2) years experience in job offered or two (2) years experience in mechanical engineering research and development. Candidate must also possess demonstrated expertise designing mechanical systems using Pro/Engineer and Solidworks; demonstrated expertise utilizing mechanical design systems running on Unix and Windows NT operating systems; and, demonstrated expertise utilizing mechanical design systems developed using C++ programming language (experience gained during graduate school acceptable). 40+ hours/week, 8:00AM to 5:00PM, $75,000/year. Submit two (2) copies of resume to Case #20012083, Labor Exchange Office, 19 Staniford Street, 1st floor, Boston, MA 02114. Must have proof of legal authority to work permanently in the U.S.

COMPUTER PROFESSIONALS

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Attractive salaries and benefits. Please forward your resume to: H.R. Mgr., Computer Horizons Corp. 49 Old Bloomfield Avenue, Mountain Lakes, New Jersey 07046-1495. Call 973-299-4000. E-mail: jobs@computerhorizons.com. An Equal Opportunity Employer M/F.

Systems Engineer: Will perform LIM measurements & automatic macro defect detection on company microchip wafer inspection system and sorters. Will work at client sites throughout US. All resumes should be faxed to: Attn: L. Guidone, 203-230-0305, Microtronic, Inc. 4 Charlesgate East, Ste. 801, Boston, MA 02215

Director of MIS & Technology wanted to perform enterprise-wide technology & info systms implmtn using ERP tools, plus utilize general bus knowl in various areas. Pos is loc in Houston, TX. Hrs: M-F 9-5. Must have BS (or equiv) in Comp Sci, Engg or related field +5 yrs exp in position offd, or in related occupation such as S/ware Consultant or Project Engr for info systms dvlpmt & implmtn. Apply to: Attn: Jackie Meredith-Batchelor, P.O. Box 8018, Philadelphia, PA 19101-8018.

Wild Tangent, Inc. seeks Sr. S/W Engnr for Bellevue Office. DESC: Dsgn, dev & impl compressed & streaming RT digital video & 3D multimedia computer graphics & animation app's util C/C++, DirectX, COM, Java & scripting languages to run on multiple platforms, incl Win based O/S. Execute & apply current rsrch math models for compression, image processing & 3D graphics. REQ: BS in Engnr, CS, Math or Phys + 3 yrs of exp dsgning, deving & impling RT computer graphics & animation app's util C/C++, DirectX, COM, & scripting languages to run on Win based O/S, & 1 yr of exp dsgning & deving math models for compression, image processing, digital video & 3D graphics. Pls send resume to WT-101 Wild Tangent, 18578 NE 67th Ct; Build 5, Redmond E. Office Complex, Bellevue, WA, 98052. Job# required.

Net/Programmer/Analyst II
Provide functional and technical expertise for enhancements and for maintenance of existing functionality of the NET/Leshner applications, including design, development of programs specifications, code writing, testing and implementation. Develop function and program specifications, write RPG code, test, implement support, and maintain applications enhancements. Assess requirements and translate them into code. Candidates must have a Master's or equivalent in Computer Science, MIS, Engineering, or related field & 3 yrs of relevant progressive professional experience in the above stated areas. Please forward resume to Mr. Onyeka N. Nchege, Director of Mid Range Applications, Pillowtex Corporation, One Lake Circle Dr. Kannapolis, NC 28081.

BrightStar is searching for SAP Analysts/Consultants for Siebel, Basis, Sales, Distribution, HR, or Payroll projects. Send resumes to: BrightStar, 4900 Hopyard Rd., Suite 200, Pleasanton, CA 94588, Attn: HR; or e-mail to jobs@brightstar.com.

SOFTWARE ENGINEER sought by battery testing mfg. co. in College Station, TX. Must have M.S. in Computer Science plus exp. Respond by resume to: Mr. J. Zhang, S/W. Multi Electrochem Test System (METS), 762 Peach Creek Cut Off Rd., College Station, TX 77845.

Multiple openings available for Prog/Sys Analysts, DBA's, Sys/Admin and S/W Engineers to design/develop S/W appls using some of the following - Cobol, CICS, DB2; Java, PowerBuilder, HTML, XML; data warehousing, cognos; wireless/web technologies; C++, VB, Oracle, Developer 2000, SAP, ABAP/4; Oracle/Sybase/Informix database admin; Unix/NT system admin; IBM Net.Commerce, MOSeries, Websphere; BS/MS or equivalent in CS, Engg, Science, Math or Bus Admin required. Salary: $70-90K full time. Travel/relocation involved. Resumes to: HR, Smartsoft International 4898 South Old Peachtree Road, Suite 200, Norcross, GA 30071.

DATA PROCESSING & TELECOMMUNICATIONS PROF: Including Project Leaders, A/P & Systems Analysts specficially w/SAP, JAVA, CDMA, GSM wireless telecommunications exp. to work in consulting environment. Fax to 818 502 3311 or email to losangeles@abraxas.com

Software Engineers - Job#1) Lead a s/ware development grp-Intergrate ORACLE applications using web methods, XML, J2EE, CGI, PERL, Servlets, MO Series, Pivotal eRelationship CRM.
Job# 2) Desgn, dvlp, implmt & tech support s/ware systems in ADABAS,NATURAL,TSO,COBOL, DB2.
Reqs 2 yrs experience on job with a MS or 5 Yrs on Job with a BS in Engg or equivalent.$89K To: Shiva Systems 635 Anderson Cir 109 Deerfield Beach FL 33441

Software Engineer Washington, DC Require experience in design and development of applications in ColdFusion, SOL Server, Visual Basic, C++, Oracle. Attractive compensation package. Send resume by fax only to Votenet Solutions Inc. at (775) 201-7279

Senior Software Engineer wanted in Naples, FL. Research, design and write computer software for business decision support applying techniques of software engineering and mathematical analysis for SAP Systems. Designs Data Models and develops data warehouses, database applications using SAP R/3 and BW. Requires Masters degree in Computer Science/Computer Engineering or related field and 3 years progressive experience in SAP Business Warehouse. Send resumes to: HR Dept., Timaska Consulting, 215 Sunbelt Circle, Sanford, FL 32771.

Computer Programmer

Quantum Performance Solutions seeks a Computer Programmer in our Bethlehem, PA loc. Position involves designing, developing, writing and implementing Web based applications. Involves use of technologies including ASP, Java Script, HTML, IIS, SOL Server and Admin, Active Reports, Crystal Reports/Web, Robo Help/Web, ChartFX Web Charting, and Web Server Admin. A qualified applicant must have Bachelor's in Comp. Sci or related field and 3 yrs of relevant experience. Applicants send résumé to HR, Ouantum Performance Solutions, 528 North New Street, Bethlehem, PA 18018.

Systems Engineer wanted by info technology co in NYC. Provide tech support; install and maint client systems and netwrks. Sun Solaris, Veritas products, Oracle, PL/SOL, Unix. Resume to Enterprise 24x7 Inc., 292 Fifth Ave, 4th Fl, NY, NY 10001.

Programer/Analyst: Design and develop database applications using ERWIN, SOL/PL/SOL, PeopleSoft HRMS and financials as well as Oracle tools (forms, reports and graphics). Test applications for quality assurance. Implement and train users with new products. Req. BS or equivalent in CS or CIS w/ nine months experience in job offered or software development. Must be proficient in Crystal Reports and OOA&D on Unix. $50,000/yr, 9-5, 40 hr/wk. Send resume to Softedge, Inc. at 4675 N. Shallowford Road, Suite 206, Atlanta, GA 30338.

F/T Project Implementation Specialist. Responsible for working with the customer to analyze and document data processing requirements and implement data programming for processing those requirements. Configures and installs applications using C/C++, COBOL, UNIX and Windows. Work background must have included exp. with the US telephone billing/mediation industry. Must have a Bachelor's degree in Computer Engineering or foreign degree equivalent. Must have two years exp. Salary: Competitive. Send resume to: R. Laudenschlager, Intec Telecom Systems, 5775 Peachtree Dunwoody Rd., Bldg. G, 3rd Fl., Atlanta, GA 30342.

World Wide Automotive, Inc. is looking for exp. Sr. Business Analyst Programmer. Strategic design, development & implementation of financial systems for automation of business processes using MFG/PRO. 70% travel. Req. Bach. deg. in Business Admin., Comp. Sci. or rel. field, 3 yrs. exp. in job offered or 3 yrs. exp. in developing bus. proc. automation s/w in MFG/PRO. Please send resume to www.wwt-recruiting.com.

Programmer/Analyst, Columbia, MD. Analyze, design, implement & test e-business applications & project full lite cycle; develop engine track protal using content management software tools & develop web-based solutions for warranty groups. Work w/Java technology, Oracle, VB, Apache, Rational Rose, scripting Tcl, HTML, & SOL Server. Reqd: B.S.C.S. & 2 yrs. exp. Freq. Reloc. within U.S. may be necessary. M-F, 40 hrs/wk, 9am-5pm. Send resume to J. Brigham, HR #777, TEK Systems, 6992 Columbia Gateway Drive, Columbia, MD 21046.

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Federal Reserve

continued from page 1

cials acknowledge they have no concrete plan for handling the authentication of online identity for the Web-based processing they want to begin this year.

Nor is the Fed alone in its quandary over security. Pay.gov, a government Web site supporting ACH-based transactions, is struggling with ACH authentication. The Department of the Treasury's Financial Management Service runs that site.

According to Pay.gov program manager Greg Till, the Web site whose ACH processing is handled by the Federal Reserve Bank of Cleveland, is "operating in limited fashion" as it tries to figure out authentication procedures. Currently, only a limited number of personnel from the Department of Veterans Affairs and the Bureau of Alcohol, Tobacco and Firearms use the site under what Till calls "the friends and family" privacy method of carefully dispensing passwords to known agencies and businesses.

"We understand the risks, and we're thinking about reliability and security," said Bill Burouski, senior vice president at the Federal Reserve Bank of Chicago, who joined other Fed executives at last week's Payments 2002 conference in Dallas to discuss this embrace of online processing.

The Fed considers one of the strongest forms of authentication, digital certificates, as too "cumbersome" after testing them during Web services pilot projects with about 100 financial institutions.

The Fed may adopt just simple passwords or perhaps the stronger authentication provided by smart cards and token-based authentication, Burouski said.

"All of us are going to have to think hard about risks and mitigation," said Sally Green, executive vice president at the Federal Reserve Bank of Boston.

Moving to open systems poses a greater security challenge than do the old terminals used to access the Fed network today, she acknowledges.

Green said the Fed has decided to abandon the development of an expensive Windows-based application it had worked on for years to replace the Fed's older DOS-based payments programs. The DOS-based programs are still put to use on terminals among banks today.

"We have chosen not to roll out our Fedline for Windows product and instead will go directly to Web-based services," Green said. "Historically, we've used proprietary hardware, software and services, but the Web will allow us to reach more users in more locations."

The Federal Reserve, and banks in general, are surprised by the results of the Fed's just-released study of the volume of checks and electronic payments made in the U.S. in 2000. That study has many in this community thinking they will miss the e-commerce payments wave unless they quickly get on board and take advantage of processing on the Web.

> **"Electronic payments are on the cusp of becoming the dominant payment. But are we ready for it?"**
>
> **Cathy Minehan**
> President, Federal Reserve Bank of Boston

The study shows that there were 49.6 billion checks worth a total of $47.7 trillion written in 2000, as opposed to the 32 billion checks worth $24 trillion written in 1979. The surprise is that the share of checks to electronic payments has declined from 85% in 1979 to about 60% in 2000.

The term "electronic payments" refers to credit and debit cards, ACH and Electronic Benefits Transfer (used in government financial assistance programs). ACH accounted for 78% of electronic-payment dollars and 19% of transaction volumes.

"I'm seeing a pace of change unlike any in my experience," said Cathy Minehan, president of the Federal Reserve Bank of Boston.

"The payments system we've known for so long may be disappearing. Electronic payments are on the cusp of becoming the dominant payment. But are we ready for it?" Minehan asks.

"The Fed identified 18 billion checks that could be replaced each year by ACH," says Janet Boyst, senior vice president at Wachovia Bank and a board member of the National Clearing House Association (NACHA), the organization that sets rules for ACH. With the Web growing in importance in payments processing,

NACHA last week said it would launch its own study to better define security requirements for next-generation ACH networks.

NACHA already took its first step in this arena last March when it issued NACHA Web Payments Rules for authorizing consumer debit over the Web. Companies have started to use ACH in Web transactions.

DaimlerChrysler now offers a way for car buyers to pay each month at its Web site by initiating a debit payment for the car loan. It outsourced the ACH payment function to Fort Knox National Company (FKNC). Customers paying loans online are transferred to a Web page at the FKNC Web site that looks like the DaimlerChrysler Web site. FKNC collects the ACH authorization for the money to be transferred from the customer's bank account after the buyer authenticates his identity.

That authentication is actually a "shared secret" known by the buyer and DaimlerChrysler, said Karen Brewster, manager of lockbox control at DaimlerChrysler Financial Services, who spoke on the topic at Payments 2002.

After the ACH debit is authorized, the customer gets an e-mail confirming that the funds were withdrawn from his account.

Priscilla Capes, executive vice president at FKNC, said the NACHA rules for the Web so far require that each session between buyer and the site must be encrypted by 128-bit Secure Sockets Layer and have in place a "fraudulent-transaction detection system," in addition to an annual security audit. ■

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Cisco

continued from page 16

aggregated over four ports, and like many of Cisco's IP products, it will have virtual LAN, Open Shortest Path First Routing and SNMP, and support distances of up to about 3,100 mile between devices.

The company also says it will add the Layer 2-7 services to the SN 5420 and future products such as the FCIP blade and the SN 5428. These services include virtual LAN, virtualization and remote copy support.

Customers say this is a boon.

"Any new storage routers would have to be managed and monitored with the current tools we use to monitor our current Cisco network," Medical College's Vieth says. "We don't have time to learn another piece of management software that would be used exclusively for storage routers."

Cisco has as many as 100 employees dedicated to storage. It also has invested $42 million in storage start-up Andiamo. Andiamo is making a large multiprotocol switch that will compete with Brocade's Silkworm 12000 and have iSCSI, Fibre Channel and DWDM modules. Brocade has promised iSCSI, FCIP and InfiniBand, but so far has only delivered 128 Fibre Channel ports.

However, tension is palpable between Cisco's Storage Business Unit and Andiamo, sources say, leading them to question which division of Cisco ultimately will deliver port-dense storage products. Observers say that if Andiamo's products are successful, Cisco will invest as much as $142 million more. Cisco also has agreed to acquire the company for as much as $2.5 billion.

Last year, the company invested in a 10% share of StoreAge Networking Technologies, a start-up that is virtualizing data by forming it into common pools that can be accessed and managed from a common interface. Cisco has indicated its storage products will be the platform for services such as virtualization and virtual SANs.

The company also announced plans to enter the storage service provider market, providing gear to implement large dispersed data centers. Cisco currently has the ONS 15540 DWDM switch, which accomplishes long-range transport of data over IP. Coupled with the SN 5420, or the new switch and existing Catalyst 6500 switches, Cisco is working toward that goal.

Despite the activity, some experts remain skeptical about Cisco's chances in the storage market.

"I really need to see Cisco have some success with storage," says Tony Prigmore, an analyst with Enterprise Storage Group. "I understand why you have to give them respect because of who they are, but they have to earn a lot more respect with volume and meaningful customer relations before they can be considered a storage player." ■

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■ **Network World**, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

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BackSpin Mark Gibbs

<My brain hurts/>

As you may have noticed, over in my evil twin's domain, Gearhead (page 50), the topic of the last gazillion columns has been Web services. It has been a feast of acronyms, a smorgasbord of technology and a deluge of detail. We have been extended with XML, lathered with SOAP, schemed with XSD and rocked by RPC, not to mention directed by UDDI and serviced by WSDL. I don't know about you, but my brain hurts.

While Gearhead has taken a pretty good swing at the nuts and bolts of Web services, what Gearhead hasn't and won't be doing is covering the other half of the equation: the business issues. What will Web services do for business?

There has been too little coverage of why, as business people, we should be concerned with using this panorama of technology. After all, if you peel away the bits and bytes and take a look at Web services, there's definitely the appearance of the emperor's new clothes. Once the technology is out of the way, what do we have? Some processes that are the result of new code or legacy code being presented as XML content through services over TCP/IP connections. Doesn't sound very "new" does it?

But the opposite is true. It is all about the context of how Web services are structured, presented and delivered rather than the mechanics of doing so that makes Web services such a powerful idea and profound business strategy.

What's happening is we are taking the first small leap of the next evolutionary jump in information technology. In fact, let me be more bold than that: This evolutionary jump will not be just an IT phenomenon — it will change the way our culture functions in terms of business practices, communications, entertainment and education.

The windup for this jump lies in the explosion of XML and the lack of structure in our legacy data. I have read that in the average corporation, unstructured content accounts for some 84% of all data. While knowledge-mining tools can extract information from the data, the accuracy of that process is questionable: You will only be able to establish the context of some small percentage of the data you own and that context won't be exact — it will be assumed from inference and clues concerning the location, known sources and dating of the data.

Sure, sophisticated data mining and analysis tools are available — see my Web Applications newsletter on an interesting tool called Stratify Discovery Server (www.nwfusion.com, DocFinder 9041). These kinds of tools can have tremendous value, but they aren't going to deal with all your legacy data. Time and expense set limits on what can be mined.

But it is the future that matters. As XML becomes as commonplace as, say, HTML, we will start to have knowledge about our business operations built into our data. We will build implicit procedural knowledge into our business processes simply by producing structured data.

Then we'll wrap that vision in defined services to control access. Digital Rights Management (DRM) and privacy controls, à la the W3C's Platform for Privacy Preferences Project (P3P), will make the distribution of data and information far more controllable than it is today. Security becomes easier because you know what you own. If you place a value on some type of data, you should be able to find out exactly how much of that data exists, where it is and who has access to it.

Now this might sound abstract, but think of it in practical terms — in terms of knowing how every piece of data was generated and why, and where it fits into your business and how it can be moved around, distributed and modified. The implications for how we do business in the private and public sectors, and how we are entertained, informed and interact are profound.

It is going to be quite an evolutionary step. I expect my head will hurt for some time.

Discuss your aching head with backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

If you really love a book, set it free

There was a time not long ago that venture capitalists would have been queued up outside Ron Hornbaker's Kansas City, Mo., office waving multimillion-dollar checks for "the eyeballs" being drawn to his year-old Web site: www.bookcrossing.com.

The fact that no one's lined up today doesn't make Hornbaker's baby any less cool.

BookCrossing.com is an online community for people who love books and would rather hand their dog-eared favorites to a total stranger — for free — than see those books collect dust on a shelf, or worse, wind up in a landfill. You don't need the Web to avoid these fates, of course, so what's interesting here is that there's also a "message in a bottle" twist to the site that pays the participant an intangible return no used bookstore could match.

In a nutshell, BookCrossing members "release" their books "into the wild" — they leave them in a public place — after having registered the titles on the site and affixed provided stickers that explain the purpose of BookCrossing. The stickers include a unique, randomly generated identification number.

In theory, the person who stumbles across the book is supposed to note the sticker, be intrigued, visit www.bookcrossing.com, report the ID number and log a journal entry about the find. They're also supposed to read the book, of course, and offer a review of its merits.

The kicker comes from learning the book you released has found a good home and continues to make the rounds. The kicker, sadly, is that only about 10% of the books are ever heard from again . . . although that doesn't seem to discourage the participants. Rather, they do make a journal entry saying 'Hey, I found this book at such and such a date. [An application on the site] e-mails all the previous owners — including the original registrant and anyone along the chain who has made a journal entry on that book — to let them know," Hornbaker says.

Hornbaker was moved to launch BookCrossing after visiting www.wheresgeorge.com — a popular yet puzzling site that lets members register and track the circulation of dollar bills — and www.phototag.org, one of a number of sites that apply the pass-it-along theme to disposable cameras. (Buzz can only imagine the outtakes.)

BookCrossing has 3,400 members and is adding about 80 per day, says Hornbaker, whose real job is being president and CTO at Humankind Systems, a software development company.

The BookCrossing site is certainly slick — as opposed to those from which it drew inspiration — and if nothing else stands as a compelling advertisement for Humankind. But might it ever stand on its own as a business?

"Someday, when we have critical mass, having this many book lovers under our control will be a powerful thing," Hornbaker says. "When we get serious numbers, we'll be able to feature new books [for a fee] . . . and promote them in a viral way."

In the meantime, the site will go on making a whole lot of book lovers happy.

It's much bigger than a breadbox

Most public relations stunts stink because they insult the intelligence of the public and the press.

But, I like this "contest" question from Lumeta, a network management and security vendor: "How big is 2 to the 104th?"

The idea is to describe in mere words the vastness of that number, which is "more than 20 million trillion trillion," according to Lumeta. (The number matters to Lumeta because its firewall reportedly simulates that many types of packets in generating its reports.) Here's an example of what they're looking for:

"Did you know that 2 to the 104th atoms of lead make a sphere almost 35 feet in diameter? It would weigh 15.5 million pounds."

Got a good one? Enter at www.lumeta.com.

Don't get too excited, though: The prizes are nowhere near as impressive as that number.

Contacting the column is easier. The address is buzz@nww.com.

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